

A SURVEY OF THE EXTRA-ETHIOPIAN
ORETINAE (LEPIDOPTERA : DREPANIDAE)



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CONTENTS

	Page
SYNOPSIS	151
INTRODUCTION	151
Acknowledgements	152
Generic affinities	152
Distribution	152
KEY TO GENERA OF ORETINAE, OTHER THAN ETHIOPIAN GENERA	153
<i>Oreta</i> Walker	153
KEY TO SPECIES-GROUPS	160
SPECIES-GROUP <i>ROSEA</i>	161
SPECIES-GROUP <i>INSIGNIS</i>	195
SPECIES-GROUP <i>EXTENSA</i>	199
SPECIES-GROUP <i>FUSCOPURPUREA</i>	201
SPECIES-GROUP <i>CARNEA</i>	201
SPECIES-GROUP <i>RUBROMARGINATA</i>	204
<i>Urogonodes</i> Warren	206
<i>Astatochroa</i> Turner	208
<i>Spectroreta</i> Warren	210
<i>Cyclura</i> Warren	212
REFERENCES	217
INDEX	220

SYNOPSIS

The 54 species of the five genera of Oretinae occurring outside the Ethiopian Region are reviewed. [The ten genera and 62 Ethiopian species have been dealt with by Watson (1965).] Speciation and distribution in *Oreta* are discussed. The genus *Oreta* is revised to species-group level, and to species level in the species-groups *rosea* and *fuscopurpurea*; the Chinese species of each species-group are treated in detail. *Spectroreta* is fully revised. *Astatochroa*, *Urogonodes* and *Cyclura* are diagnosed, the revised synonymy and distribution of the included species given and the type-species of each genus illustrated.

INTRODUCTION

THE bulk of the material examined during this study is in the British Museum (Natural History) and the Museum Koenig, Bonn. The Bonn material forms part of the important collection made by the late Dr. H. Höne during the 1930's in central, southern and eastern China. Other material has been borrowed from: Division of Entomology, C.S.I.R.O., Canberra, Australia; Forest Experiment Station, Seoul, Korea; H. Inoue Collection, Tokyo, Japan; Institut für Spezielle Zoologie und Zoologisches Museum der Humboldt-Universität, Berlin, D.D.R.; C. Kimball Collection, U.S.A.; Bryant Mather Collection, U.S.A.; Museum of Comparative

Zoology, Cambridge, U.S.A. ; Muséum national d'Histoire naturelle, Paris, France ; South Australian Museum, Adelaide, Australia ; United States National Museum, Washington, D.C., U.S.A.

The type material of most nominal species has been examined : the exceptions are noted in the text. Lectotypes or neotypes are designated where necessary.

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The line drawings were prepared by Mrs. Janet E. Saunders. The half-tone illustrations are based on photographs taken by the Photographic Section of this Museum under the control of Mr. M. G. Sawyers.

My colleagues D. S. Fletcher, I. W. B. Nye and P. E. S. Whalley have checked parts of the manuscript and made several helpful suggestions. Mr. D. S. Fletcher generously offered to carry out the final assembly of the text, drawings and photographs.

Generic Affinities. A preliminary study of the affinities between the Oriental and Ethiopian genera of Oretinae indicates that two, hitherto unsuspected, fairly close relationships may exist ; firstly between *Spectroreta* Warren (see p. 210) and *Archidrepana* Warren (1902a : 487 ; see Watson, 1965 : 142) and secondly between *Cyclura* Warren (see p. 212) and *Epicampoptera* Bryk (1913 : 7 ; see Watson, 1965 : 9). Both *Spectroreta* and *Cyclura* are endemic to and widely distributed on the Oriental Region, ranging from the Indian Subregion to the Papuan Subregion, while *Archidrepana* and *Epicampoptera* are endemic Ethiopian genera, the former being known only from Madagascar and Comores, the latter common to Madagascar and Africa south of the Sahara.

The three remaining genera of non-Ethiopian Oretinae, *Oreta* (p. 153), *Astatochroa* (p. 208) and *Urogonodes* (p. 206) are probably quite closely allied. On distributional evidence it is arguable that the small Papuan genera *Astatochroa* and *Urogonodes* are derivatives of *Oreta*, a large widespread Oriental, eastern Palaearctic and Nearctic genus.

Distribution. The subdivisions of the Oriental Region adopted by Gressitt (1956) have been followed throughout this paper. Details of the distribution of the five genera under review are given under each genus. To summarize the generic and species ranges : *Oreta* is Oriental (33 endemic species), Palaearctic (Manchurian Subregion) (two endemic species) and Nearctic (one species, *rosea* Walker), with three species shared between the Manchurian Subregion and the Indo-Chinese Subregion. *Oreta* is found throughout the Oriental Region, except for the Polynesian Subregion. *Urogonodes* and *Astatochroa* are Oriental (three and two endemic species

respectively); neither is found outside the Papuan Subregion. *Spectroreta* (one species) and *Cyclura* (nine species) are also solely Oriental. *Spectroreta* occurs in the Indian, Indo-Chinese, Malayan and Papuan Subregions; *Cyclura* in every Subregion except the Polynesian.

It may be useful to mention here the extent of the Chinese representation of Oretinae for purposes of comparison with other groups of Lepidoptera which have received attention over the last 30 years as a result of the availability of the extensive Oberthür and Höne collections. Seventeen species of *Oreta* are known to occur in China together with the single species of *Spectroreta*. *Cyclura* occurs in Formosa (2 species) but not on the mainland of China.

KEY TO THE GENERA OF ORETINAE, OTHER THAN ETHIOPIAN GENERA

[For the latter see Watson, 1965]

- 1 Fore and hind wings with hyaline patch or patches. Proboscis absent. Antenna bipectinate. Gnathos of ♂ genitalia without posterior processes **SPECTRORETA** (p. 210)
- Fore and hind wings without hyaline patch or patches. Proboscis present, but vestigial. Antenna bipectinate or lamellate. Gnathos of ♂ genitalia with or without posterior process or processes 2
- 2 Upper surface of fore wing with irregularly shaped dark marking near costal end of postmedial fascia (Pl. 9, fig. 124). Outer margin of hind wing with or without short curved process. Gnathos of ♂ genitalia with pair of forcipulate posterior processes (Text-fig. 88) **CYCLURA** (p. 212)
- Upper surface of fore wing without irregular dark marking near costal end of postmedial fascia. Hind wing without process. Gnathos of ♂ genitalia with single medial posterior process (Text-fig. 1), or with non-forcipulate paired processes, or without processes 3
- 3 Antenna bipectinate **ORETA** (part) (p. 153)
- Antenna lamellate 4
- 4 Areole present in fore wing 5
- Areole absent in fore wing **UROGONODES** (p. 206)
- 5 Dark subterminal spot present on Cu_{1a} on upper surface of fore wing. Mid and hind tibiae without glabrous longitudinal line. ♂ genitalia with anterior margin of tegumen emarginate medially. (Text-fig. 84) **ASTATOCHROA** (p. 208)
- Upper surface of fore wing without dark subterminal spot on Cu_{1a} . Mid and hind tibiae with glabrous longitudinal line. ♂ genitalia with anterior margin of tegumen not emarginate medially **ORETA** (part) (p. 153)

ORETA Walker

(Pl. 7, figs. 113–115; Pl. 9, fig. 119)

Oreta Walker, 1855 : 1166. Type-species, *Oreta extensa* Walker, 1855 : 1166, by subsequent designation by Kirby, 1892 : 728.

Oreta Walker; Strand, 1911 : 204; Warren, 1923 : 479; Gaede, 1931 : 42 [Partim]; Inoue, 1962 : 37.

Dryopteris Grote, 1862a : 360. Type-species, *Drepana rosea* Walker, 1855 : 1164, by subsequent designation by Grote, 1863 : 345. [Synonymized by Kirby, 1892 : 728.]

Hypsomadius Butler, 1877 : 478. Type-species, *Hypsomadius insignis* Butler, 1877 : 478, by monotypy. **syn.n.**

Hypsomadius Butler; Strand, 1911 : 205; Gaede, 1931 : 42; Inoue, 1962 : 41.

- Holoreta* Warren, 1902 : 340. Type-species, *Cobamilla jaspidea* Warren, 1896a : 335, by original designation. [Synonymized by Warren, 1923 : 480, by transference of type-species to *Oreta*.]
Oretella Strand, 1916 : 164. Type-species, *Oreta (Oretella) squamulata* Strand, 1916 : 164, by monotypy. [Synonymized by Gaede, 1931 : 43.]
Psiloreta Warren, 1923 : 485. Type-species, *Oreta sanguinea* Moore, 1879 : 85, by original designation. **syn.n.**
Psiloreta Warren; Gaede, 1931 : 47; Inoue, 1962 : 38.
Mimoreta Matsumura, 1927 : 46. Type-species, *Mimoreta horishana* Matsumura, 1927 : 46, by monotypy. **syn.n.**
Rhamphoreta Bryk, 1943 : 25. Type-species, *Oreta (Rhamphoreta) eminens* Bryk, 1943 : 25, by monotypy. **syn.n.**

♂. Proboscis vestigial. Antenna bipectinate, open-lamellate or closely lamellate (Text-figs. 91, 92). Apex of fore wing variously falcate, outer margin straight, convex or angulate; areole present, vein R_1 arising from areole or from cell. Outer margin of hind wing convex; sinuous or angulate; vein $Sc + R_1$ approximated to R_s for short distance distal to end of cell, but anastomosed with R_s in some specimens of *rosea*. Wing without hyaline areas. Ground-colour of wings various shades of brown or yellow, often speckled or striate with buff or brown. Upper surface of both wings with antemedial and postmedial fasciae (but poorly marked or absent in species-group *rubromarginata*) and with or without lustrous white cell-spot or spots. Postmedial fascia extending obliquely across upper surface of fore wing from near apex, except in species-group *rubromarginata* in which this fascia, where present, is approximately parallel to outer margin of wing; one or two dark spots present or absent at tornus of fore wing. Large dark spot present near outer margin between M_1 and M_2 on upper surface of hind wing in most specimens of *obtusata* and *brunnea*, absent in remaining species. Tibiae of mid and hind legs each with one pair of terminal spurs, and with glabrous, often dark-coloured, longitudinal line extending along outer surface.

♂ genitalia: anterior margin of tegumen not emarginate medially; saccus digitate or entire; valve variously shaped, with or without process or processes; with anellus in species-group *fuscopurpurea*, without anellus in remaining groups; diaphragma with paired medial sclerites in species-group *insignis* and in most species of species-group *carnea*, without medial sclerite in remaining groups; gnathos without medial process, with pair of medial processes or with single posteriorly directed medial process; uncus bifurcate, emarginate or entire posteriorly, invariably with pair of lateral lobes; aedeagus variously shaped, with or without lateral lobes or terminal processes, vesica with or without cornuti or spines; eighth abdominal sternite with pair of lateral apodemes, posterior margin variously shaped, with lateral processes in most species.

♀ genitalia: ostium with or without ventral and lateral opercular structures; ductus bursae short, at least partly sclerotized; corpus bursae with single signum or without signum; post-ostial segments variously developed.

There is little external sexual dimorphism in *Oreta* except in the shape of the fore wing, the outer margin of which is more strongly convex in the ♀ than in the ♂ or is weakly convex in the ♀ of those species where the outer margin of the ♂ fore wing is straight.

A considerable degree of individual variation is present in most species. This may take the form of variation in the ground-colour, or variation in the colour and definition of the markings. In many species there are two colour-forms: one in which the upper surface of both wings is yellow distal to the postmedial fascia (except for a brown marginal band on the fore wing and a brown area at the outer angle of the hind wing), and a second form in which there is no yellow coloration distal to the postmedial fascia. The first of these forms is referred to in the following pages as the

yellow-and-brown form and the second as the brown form of the species. Both colour-forms occur, for example, in *pulchripes*, and have been illustrated in colour by Inoue (1961).

Affinities (see p. 152). The monotypic Madagascan genus *Oretopsis* Watson (1965 : 145) is similar to *Oreta* in colour-pattern and wing shape, but differences in the venation and the highly characteristic ♂ and ♀ genitalia do not indicate close relationships between them. Also similar in colour-pattern, but on the evidence of other characters not closely allied to *Oreta*, are the Ethiopian genera *Isospidia* Watson (1965 : 132) and *Uranometra* Bryk (1913 : 7). Possible closer relationships are suggested by external and genitalic similarities between *Oreta* and the Papuan genera *Urogonodes* Warren (1903a : 347) and *Astatochroa* Turner (1926 : 415).

Centre of Origin. It seems unlikely that *Oreta* evolved outside the Oriental Region. Only six species are known to occur beyond the limits of this Region : the Nearctic *rosea*, for which an Oriental origin is proposed (see p. 159) ; *turpis*, *insignis* and *fuscopurpurea* which are shared between the Oriental Region and the south-eastern part of the Palaearctic Region ; and *pulchripes* and *paki* which are respectively Russo-Japanese and Korean but are closely allied to species in a predominantly Oriental species-group. Without fossil evidence it is hazardous to suggest a more exact centre of origin but, judging from the relative paucity of the Papuan fauna in terms of species and species-groups, and the absence of the genus in the Polynesian Subregion, it is reasonable to assume that the genus did not originate in the eastern part of the Oriental Region. The presence of only one species of *Oreta* in Ceylon and southern India eliminates the Indian Subregion as a probable centre of evolution and points to the mainland of south-eastern Asia and its south-eastern archipelago as the probable evolutionary centre of *Oreta*.

Species-groups. Six reasonably well-defined species-groups can be distinguished, the most useful diagnostic features of which can be extracted from the key on page 160. General similarities in the genitalia and colour-pattern of both sexes indicate that the groups *rosea* and *insignis* seem to be fairly closely allied and that there are similar close affinities between the groups *extensa* and *fuscopurpurea* but less close affinities between *carnea* and *rubromarginata*. The present morphological evidence does not justify much more than these tentative generalizations concerning the phylogeny of *Oreta*. An attempt to establish the characters which are primitive relative to *Oreta* has proved unsuccessful : those characters which occur generally throughout the subfamily and could therefore be regarded as primitive where they occur in *Oreta*, are not confined to or clustered in any particular species-group. The distribution of the species-groups is equally unhelpful in assessing the phylogeny of *Oreta* as their ranges either coincide or overlap over a wide area.

Distribution of species-groups and species. [Zoogeographical terms are those of Gressitt (1956).] The group *rosea* (p. 161) includes seventeen species, fourteen of which occur in China. Its range is chiefly Indo-Chinese (12 endemic species) with minor incursions into the Malayan Subregion and the Celebes transitional zone of the Oriental Region (one species shared between Celebes and the Malayan and Indo-Chinese Subregions) and into the Manchurian Subregion of the Palaearctic Region (two endemic species and one shared with the Indo-Chinese Subregion), but includes a

single Nearctic representative, *O. rosea*. The group *insignis* (p. 195) is best represented in the Papuan Subregion (four endemic species and one shared between the Papuan and Malayan Subregions and Celebes) with a poorer representation in the Malayan Subregion and Celebes transitional zone (two endemic Malayan species and one shared between Celebes and the Malayan and Papuan Subregions). One species, *insignis* occurs in China and Formosa but also penetrates into the Palaearctic Region (Japan), the only species in this group to do so. Although at least ten species can be included in the group *insignis*, only eight of these have so far been named. The group *extensa* (p. 199) extends across the whole of the Oriental Region except for the Polynesian Subregion. One of the four known species, *extensa*, is shared by the Indo-Chinese and Malayan Subregions and Celebes; one is restricted to the Malayan Subregion, and one to the Indian Subregion. There is some doubt about the type-locality of the remaining species, *adona* (see p. 200). *O. extensa* is the only species of its group to occur in China. The next group, *fuscopurpurea* (p. 201), has only one species, recorded from both the Indo-Chinese Subregion of the Oriental Region and the Manchurian Subregion of the Palaearctic Region. Five species are united in the species-group *carnea* (p. 201): one Malayan, one from Celebes, two Papuan and one common to the Indo-Chinese and Malayan Subregions, the latter species (*griseotincta*) having been recorded in Formosa but not from continental China. The sixth and final group, *rubromarginata* (p. 204), which includes five species, has been collected only in the Malayan and Philippine Subregions and in the Celebes transitional zone of the Oriental Region. Three species appear to be endemic to the Malayan Subregion and one to the Philippine Subregion, while the fifth is shared by these two Subregions and Celebes.

To summarize the distribution of the species-groups: *rosea* is Oriental, Palaearctic and Nearctic; *insignis* is Oriental and Palaearctic; *carnea* and *rubromarginata* are entirely Oriental in distribution.

The total representation of the 39 described species of *Oreta* in each of the three zoogeographical regions where the genus occurs is as follows:

Palaearctic Region (Manchurian Subregion): 5 species, including 2 endemics and 3 shared with the Indo-Chinese Subregion of the Oriental Region.

Nearctic Region: 1 endemic species.

Oriental Region: 36 species, including 33 endemics and 3 shared with the Manchurian Subregion of the Palaearctic Region.

Indo-Chinese Subregion: 18 species, including 12 endemics, 3 shared with the Manchurian Subregion of the Palaearctic Region, 1 shared with the Malayan Subregion and 2 shared with the Malayan Subregion and Celebes.

Indian Subregion: 1 endemic species.

Malayan Subregion: 12 species, including 8 endemics, 1 shared with the Indo-Chinese Subregion, 2 shared with the Indo-Chinese Subregion and Celebes, and 1 shared with the Papuan Subregion and Celebes.

Philippine Subregion: 1 endemic species.

Celebes Transition Zone: 4 species, including 1 endemic, 2 shared with the Malayan and Indo-Chinese Subregion and 1 shared between the Malayan and Papuan Subregions.

Papuan Subregion : 7 species, including 6 endemics and 1 shared with the Malayan Subregion and Celebes.

Polynesian Subregion : no species is known.

The above analysis shows, as far as the limited number of species allows, the relevance to *Oreta* of the Subregional divisions of the Oriental Region proposed by Gressitt (1956, 1958). Celebes is transitional both between the Malayan and Philippine Subregions and between the Malayan and Papuan Subregions, while the Indo-Chinese, Malayan and Papuan Subregions are reasonably well-defined by the degree of species endemism.

The total known representation of *Oreta* in China is 17 species, or 18 species if Formosa is included with China. Eight of these are at present known only from China or from China, Formosa and the southern Ryukyu Islands combined : *angularis*, *brunnea*, *flavobrunnea*, *hoenei*, *liensis*, *loochooana*, *shania* and *trispina*. One species, *griseotincta*, occurs in Formosa, N. India and the Malayan Subregion. Three species, *fuscopurpurea*, *insignis* and *turpis*, are shared with the Manchurian Subregion, four species (*eminens*, *pavaca*, *sanguinea* and *vatama*) are shared with all or part of the rest of the Indo-Chinese Subregion, while two species (*extensa* and *obtusa*) are shared with the Malayan Subregion, and Celebes, and the whole or part of the rest of the Indo-Chinese Subregion.

Further material will doubtless show the need for revision of the range boundaries of some species and species-groups, although the general pattern of distribution will probably be little changed. No material, for example, has been seen from Halmahera or the Lesser Sundas, and little from the Molluccas and the Philippines. It seems likely too that the range of several species known at present only from China will prove to be more extensive when recent collections made by German and Japanese expeditions to Nepal have been studied. A more comprehensive investigation of the B.M. (N.H.) material of the group *insignis* will probably reveal the presence of undescribed species and modify present knowledge of the previously described species.

Centres of endemism and speciation. The richest areas of endemism in *Oreta* are apparently in the Indo-Chinese Subregion (especially southern China), New Guinea, and the Malayan Subregion. In the Indo-Chinese Subregion and New Guinea the relatively small taxonomic gaps between species and the existence of geographic variation within species such as *vatama*, *hoenei* and *pavaca* suggest relatively recent and probably continuing species radiation and that the centres of speciation and endemism coincide.

The presence of eight species endemic to the Malayan Subregion possibly reflects the favourable conditions for divergence provided by repeated isolations of populations on the islands of Sundaland during Pleistocene fluctuations in sea level. Similar radiation in the Malay Archipelago has been described in detail by Zeuner (1943) for a genus of Rhopalocera and by Gupta (1962) for a genus of Ichneumonidae. In the Nearctic *O. rosea* however, the origin of which is possibly middle Tertiary and almost certainly post-Eocene and pre-Pliocene (see discussion on p. 159), much slower evolution seems to have taken place. It is closely allied to the remaining species of its

group which are Asiatic, and is separated from its close relative *pulchripes* by a relatively small taxonomic gap.

In China there are two regions which appear to be centres of radiation in *Oreta*. The first of these corresponds reasonably well with the Yunnan Centre of de Lattin (1957) (subsequently modified by Gross, 1961) where the southward and eastward extensions of the Himalayas have presumably provided sufficient geographical and ecological barriers for speciation to occur since the late Pliocene or Pleistocene orogenesis in this region. In south-eastern China the mountainous provinces of Chekiang and Fukien have also provided conditions conducive to species radiation, similar to that which has occurred in the Rhopalocera (Gross, 1961), although this centre of speciation in *Oreta* coincides more closely in position with the Sinopacific Centre of de Lattin than to Gross's South Chinese Secondary Centre.

If it is assumed that the centre of origin of *Oreta* was in Sundaland or was continental Asiatic, it follows that the Papuan centre of speciation is possibly relatively recent and probably dates from after the late Cenozoic elevation of the central mountain chain of New Guinea (King, 1962), which would have greatly increased the numbers of available ecological niches and created new topographical barriers conducive to speciation.

Dispersal and speciation. Although some over-water dispersal of *Oreta* may have occurred between the islands of Malaya, Indonesia, the Philippines and the Papuan area (particularly between Celebes and Borneo, and between Celebes, the Moluccas and New Guinea) it is likely that the most important method of dispersal has been across land connections such as those which existed during Pleistocene regressions of the sea in Sundaland. The *Oreta* fauna of Borneo, for example, shares many more species with Java, Sumatra and Malaya, with which it was connected at times during Pleistocene Glacial stages, than it does with Celebes, which had no Pleistocene connections with Borneo. In fact only four species have so far been taken in Celebes, three of them, *singapura*, *obtusa* and *extensa*, being widely distributed in the Oriental Region. The possibility that these three widespread species may be migratory is discussed later.

An example of Pleistocene speciation within Sundaland, probably as a result of island isolation, is shown in *roepkei*, a species endemic to Java (which is within the range of the closely related *extensa*), the origin of which can be explained by postulating the divergence of *roepkei* from *extensa* during an early Interglacial stage, which must have been of sufficient duration to allow speciation and to prohibit genetic swamping by *extensa* which subsequently reinvaded Java, probably during a late Glacial stage when Java was reconnected to other parts of Sundaland. (The evolution of *roepkei* elsewhere, followed by dispersal to Java, and the subsequent extinction of the species outside Java is also a possibility.)

The effectiveness of the water barrier to the west and south-west of New Guinea is indicated by the fact that two of the five species-groups present in the Malayan Subregion and Celebes are not represented in New Guinea, presumably as a result of their failure to disperse across water barriers from their supposed evolutionary centre in Sundaland or continental south-east Asia. It is also possible to argue, however,

that those species-groups not present in New Guinea have evolved more recently and have not had time to reach this island.

The species *singapura* is one which must have successfully overcome a series of marine barriers. No other species of *Oreta* is common to both the Malayan and the Papuan Subregions, though several ancestral species may have had similar extensive ranges in the Pleistocene or earlier as the genus spread eastwards before giving rise to new subspecies, as in the present-day *O. singapura*, and to new species, as in the group *extensa*. In the latter group, *O. extensa*, which occurs in India and China and extends through the Malayan archipelago as far as Celebes, is replaced in New Guinea by an undescribed species. The latter species occurs also in Celebes together with *O. extensa*, having presumably reached there after attaining specific distinction in New Guinea, thus reversing the general pattern of west to east dispersal for *Oreta*, although the alternative of evolution of the undescribed species in Celebes followed by dispersal eastwards to New Guinea and the reinvasion of Celebes by *extensa* remains a possibility. It would be instructive to know whether *extensa* is migratory or not and whether a migratory habit in *extensa* and in *singapura* and *obtusa* (the two other widely distributed species of *Oreta*) is of sufficient extent to explain their relatively greater success in surmounting water barriers.

Distribution and origin of Oreta rosea. The species-group *rosea* to which *O. rosea* belongs (see p. 161) has a generally more northerly, temperate distribution than in the remaining groups: it is centred in southern China, but is represented in the Manchurian Subregion of the Palaearctic Region by the three species *paki*, *pulchripes* and *turpis*. As there are seventeen eastern Asiatic species in this group and only one North American species, *O. rosea*, it is reasonable to propose an Asiatic origin for the group.

Regardless of which direction dispersal took, or whether the forerunners of *O. rosea* and its closest allies occurred in both North America and N.E. Asia before moving southwards during the gradual Cenozoic lowering of temperatures, it is possible to postulate a middle or late Tertiary or an early Pleistocene origin for *O. rosea*. The degree of similarity between *O. rosea* and its closest allies (especially *pulchripes*, a Russo-Japanese species) is not much less than between *obtusa* and *brunnea* for which a Pliocene or an early Pleistocene origin could be proposed (see time scale in Zeuner, 1943). *O. obtusa* and *brunnea* were probably members of a superspecies in relatively recent times; the two species now having overlapping ranges in China. Assuming similar rates of evolution both in ancestral *O. rosea* and in *obtusa*, at the latest an early Pleistocene dispersal from, say, Asia into North America of *rosea* or its ancestor must be proposed. However, suitable ecological conditions across the Bering Bridge probably did not exist later than the late Miocene, until when the Arcto-Tertiary Geoflora formed a continuous Holarctic belt (Dorf, 1959, 1960, Schwarzbach, 1961). The earliest date for a Bering dispersal, or the isolation of the North American from the Asian elements of the species-group *rosea*, is probably the Oligocene, at which time *Viburnum*, the larval food plant of both *O. rosea* and its close ally *pulchripes*, is first recorded as a constituent of the flora of northern North America (Dr. Kathleen M. Chesters, personal communication).

Many species in other orders of insects and invertebrates of eastern North America

have eastern Asian affinities similar to those of *O. rosea*. Linsley (1963), for example, states that in many respects the Cerambycidae (Coleoptera) of eastern North America (the Alleghenian fauna) are taxonomically closer to those of the Manchurian Sub-region of the Palaearctic than to the Vancouverian fauna of western North America. Schmidt (1946: 150) cites spoonbills, sturgeons, alligators and cryptobranchids in which the fossil evidence points to an early Tertiary origin of the affinities between present-day Alleghenian and eastern Asian faunal elements. Schmidt contrasts this type of distribution with that between the western European and western North American faunas for which a late Tertiary, Pleistocene or Recent dispersal is suggested.

The presence of what may prove to be a southern subspecies of *rosea* in Florida and Mississippi (see p. 164) is further evidence that *rosea* probably reached the southern United States before, or at the latest, during the Pleistocene. Hubbell (1961) has shown that geographical differentiation of North American species in Florida and the south-eastern coastal plain could have resulted from the isolation of island populations during Pleistocene inundations of the Florida peninsula.

KEY TO SPECIES-GROUPS (BOTH SEXES)

- | | | |
|---|---|--|
| 1 | Antennae bipectinate | 2 |
| - | Antennae lamellate | 4 |
| 2 | Postmedial fascia of upper surface of fore wing extending obliquely across wing from near apex (Pl. 6, fig. 110) | 3 |
| - | Postmedial fascia of upper surface of fore wing not extending obliquely across wing | |
| | SPECIES-GROUP <i>RUBROMARGINATA</i> (p. 204) | |
| 3 | Upper surface of fore wing with weakly marked postmedial fascia; large speckled area present at base and apex of wing | SPECIES-GROUP <i>CARNEA</i> (p. 201) |
| - | Upper surface of fore wing with strongly marked postmedial fascia; base and apex of wing as in Pl. 6, fig. 110 | SPECIES-GROUP <i>INSIGNIS</i> (p. 195) |
| 4 | Antennae open-lamellate (Text-fig. 91) | 5 |
| - | Antennae closely lamellate (Text-fig. 92) | 7 |
| 5 | Postmedial fascia on upper surface of fore wing arcuate (Pl. 5, fig. 109) (<i>vatama</i>) | |
| | SPECIES-GROUP <i>ROSEA</i> (p. 161) | |
| - | Postmedial fascia on upper surface of fore wing not arcuate | 6 |
| 6 | Genitalia: (♂) eighth abdominal sternite with posterolateral processes; anellus present, heavily sclerotized; gnathos with single glabrous medial process; vesica of aedeagus with cornutus (Pl. 8, figs. 116, 117); (♀) as in Pl. 8, fig. 118 | |
| | SPECIES-GROUP <i>FUSCOPURPUREA</i> (p. 201) | |
| - | Genitalia: (♂) eighth abdominal sternite without posteriorlateral processes; anellus absent; gnathos with one or two short medial processes, or medial part of gnathos absent; vesica of aedeagus without cornutus (Pl. 7, figs. 113, 114); (♀) as in Pl. 7, fig. 115 | SPECIES-GROUP <i>EXTENSA</i> (p. 199) |
| 7 | Wing-shape and colour-pattern as in Pl. 6, fig. 110; diaphragma of ♂ genitalia with paired medial sclerites (Pl. 6, fig. 111) | SPECIES-GROUP <i>INSIGNIS</i> (p. 195) |
| - | Wing-shape and colour-pattern not as in Pl. 6, fig. 110; diaphragma of ♂ genitalia without sclerites | SPECIES-GROUP <i>ROSEA</i> (p. 161) |

Scope of revision. The species in the groups *rosea* and *fuscopurpurea* are dealt with fully in the following account. Those of the remaining groups are treated critically, in that statements concerning affinities, distribution, new synonymy and other

nomenclatorial changes are based on a study of type specimens; but except for Chinese species no descriptive matter, illustrations or detailed lists of material are given.

Treatment. In general this follows Watson (1965: 7). Wing measurements are now given in the following form: range of measurements from apex of fore wing to centre of mesoscutum, followed in parentheses by the number of specimens measured.

SPECIES-GROUP *ROSEA*

Antenna open-lamellate or closely lamellate. Outer margin of fore wing angulate in *angularis*, otherwise convex or straight; postmedial fascia of upper surface oblique except in *angularis*. Outer margin of hind wing angulate in *angularis*, sinuous or convex in remaining species. Saccus in ♂ genitalia digitate or entire; valve with or without membranous lobe, with one or more spines or processes; without anellus or diaphragmal sclerites; gnathos with single posteriorly directed medial process; aedeagus with terminal process or processes, with or without terminal band or group of spines, vesica scobinate or non-scobinate with one, two or no cornuti. Ductus bursae of ♀ genitalia sclerotized, corpus bursae with single signum or without signum.

Two well-defined complexes of species are distinguishable in this group. The first includes *eminens*, *flavobrunnea*, *liensis*, *pavaca*, *sanguinea* and *trispina*; the second, *hoenei*, *loochooana*, *paki*, *pulchripes*, *shania* and *turpis*. The remaining species, *angularis*, *vatama*, *rosea*, and the species-pair *obtusa* and *brunnea*, are probably not taxonomically distant from either of the above complexes or from each other. The Nearctic *rosea* is probably closest to the *hoenei* complex.

Of the seventeen described species, six are known only from China (*hoenei*, *shania*, *flavobrunnea*, *liensis*, *trispina*, *angularis*). A further eight species also occur in China: three of these occur in North India or Sikkim (*pavaca*, *sanguinea*, *vatama*); one is common to China, Formosa and the Ryukyu archipelago (*loochooana*); one to China and Formosa (*brunnea*); one to China and Burma (*eminens*); one to China and Japan (*turpis*); while *obtusa* is found in much of the Indo-Chinese and Malayan subregions and in Celebes. One of the remaining three species is Nearctic (*rosea*); one occurs in Japan and S.E. Russia (*pulchripes*); and one is apparently restricted to Korea (*paki*).

KEY TO SPECIES OF SPECIES-GROUP *ROSEA* MALES

- | | | |
|---|---|---------------------------|
| 1 | Large brown spot present on hind wing between M_1 and M_2 near outer margin. | 2 |
| - | Hind wing without large brown spot between M_1 and M_2 | 3 |
| 2 | Genitalia as in Text-figs. 77-79 | <i>brunnea</i> (p. 194) |
| - | Genitalia as in Text-figs. 73-75 | <i>obtusa</i> (p. 191) |
| 3 | Antenna open-lamellate (Text-fig. 91). Postmedial fascia of upper surface of fore wing strongly arcuate as in Pl. 5, fig. 109 | <i>vatama</i> (p. 187) |
| - | Antenna closely lamellate (Text-fig. 92). Postmedial fascia of upper surface of fore wing not as strongly arcuate as in Pl. 5, fig. 109 | 4 |
| 4 | Outer margin of fore wing angulate at Cu_{1a} (Pl. 5, fig. 107) | <i>angularis</i> (p. 187) |
| - | Outer margin of fore wing not angulate at Cu_{1a} | 5 |
| 5 | Broad, grey, outer-marginal band present on fore wing between apex and M_3 | <i>sanguinea</i> (p. 181) |

-	Grey outer-marginal band (where present) on fore wing narrow and not extending posteriorly as far as M_3	6
6	Outer margin of hind wing sinuous (Pl. 2, figs. 98, 99), or most strongly convex at middle	7
-	Outer margin of hind wing evenly convex	12
7	Genitalia: saccus with short digitate medial process (Text-fig. 38) <i>trispina</i> (p. 177)	
-	Genitalia: saccus without medial process	8
8	Genitalia as in Text-figs. 6-8; valve process strongly arcuate <i>pulchripes</i> (p. 164)	
-	Genitalia not as in Text-figs. 6-8; valve not strongly arcuate	9
9	Genitalia: valve without membranous lobe (Text-figs. 1, 2) <i>rosea</i> (p. 162)	
-	Genitalia: valve with membranous lobe	10
10	Genitalia: vesica of aedeagus with single cornutus <i>hoenei</i> (p. 172)	
-	Genitalia: vesica of aedeagus without cornutus	11
11	Genitalia as in Text-figs. 16-18 <i>turpis</i> (p. 169)	
-	Genitalia as in Text-figs. 20-22 <i>paki</i> (p. 170)	
12	Fore wing very strongly falcate (Pl. 3, fig. 103) <i>flavobrunnea</i> (p. 186)	
-	Fore wing less strongly falcate than in Pl. 3, fig. 103	13
13	Colour-pattern of upper surface poorly marked; apical part of postmedial fascia on fore wing entirely lustrous white, posterior half of wing speckled with lustrous white scales <i>pavaca</i> (p. 181)	
-	Colour-pattern of upper surface well-marked; apical part of postmedial fascia on fore wing not entirely white, posterior half of wing not speckled with white scales	14
14	Upper surface of wings maculate (Pl. 3, fig. 102) <i>eminens</i> (p. 184)	
-	Upper surface of wings not maculate as in <i>eminens</i>	15
15	Colour-pattern of upper surface as in Pl. 2, fig. 97. Genitalia as in Text-figs. 32-34 <i>shania</i> (p. 175)	
-	Colour-pattern of upper surface not as in Pl. 2, fig. 97	16
16	Genitalia: saccus with short digitate medial process (Text-fig. 40) <i>liensis</i> (p. 179)	
-	Genitalia: saccus without medial process	17
17	Genitalia: valve without membranous lobe <i>rosea</i> (p. 162)	
-	Genitalia: valve with membranous lobe	18
18	Genitalia: vesica with cornutus; valve process robust (Text-figs. 23, 24) <i>hoenei</i> (p. 172)	
-	Genitalia: vesica without cornutus; valve process slender (Text-figs. 14, 15) <i>loochooana</i> (p. 166)	

Oreta rosea (Walker)

(Text-figs. 1-5)

Drepana rosea Walker, [10. xi] 1855 : 1164.

Oreta rosea (Walker) Kirby, 1892 : 728.

Oreta rosea (Walker); Dyar, 1928 : 632. [Good plate—probably ♀.]

Oreta rosea (Walker); Gaede, 1931 : 46.

Drepana marginata Walker, 1855 : 1165. **syn. n.**

Cilix americana Herrich-Schäffer, [31. xii.] 1855: Band 1, pl. 82, fig. 470. [Good fig.] [Synonymized with *rosea* Walker by Grote, 1863 : 345.]

Platypteryx formula Grote, 1862 : 60. [Synonymized with *rosea* Walker by Grote, 1863 : 345.]

Dryopteris irrorata Packard, [1865] : 377. **syn. n.**

The colour-pattern of the upper surface of a specimen of this species has been figured by Dyar, 1928, in Seitz. The ♂ and ♀ genitalia are figured in Text-figs. 1-5. There is considerable variation in the coloration and colour-pattern in this species. A brown form and a yellow-and-brown form occur, as in other species of this group,

but there are some intermediates. Packard gave the name *irrorata* to a pale specimen with strongly marked fasciae. There is also some variation in shape of the valve in the ♂ genitalia (Text-figs. 1, 2).

Wing: ♂ 14.5–18.0 mm. (15); ♀ 15.5–21.0 mm. (15).

The closest ally of this species is probably *pulchripes*, which is difficult to distinguish from *rosea* in coloration and colour-pattern but is easily separated by the genitalia.



FIGS. 1-5. *Oreta rosea* genitalia. 1, 2, ♂; 3, ♂ eighth abdominal sternite; 4, aedeagus; 5, ♀.

An account of the distribution and probable origin of *rosea* is given on page 159.

Compared with material from Canada and the north-eastern United States, most of the examined specimens of this species from Florida and southern Mississippi have a less strongly falcate fore wing and, in the yellow-and-brown form, a narrower yellow band between the postmedial fascia and subterminal fascia on the fore wing. With more material it should be possible to determine whether these differences have a geographical basis. As mentioned previously, Hubbell (1961) has shown that geographical differentiation (p. 160) of numerous North American species exists in south-eastern United States and can be attributed to Pleistocene events.

Type material.

rosea. Holotype ♂. Nova Scotia (*ex* Lt. Redman Coll.) Drepanidae genitalia slide No. 1706. In B.M. (N.H.).

marginata. Holotype ♂ [no locality given in description]. Genitalia slide No. 1778. In B.M. (N.H.).

americana. [Not seen.] Sex unknown, "Am. spt."

formula. [Not seen.] Holotype ♀. New York.

irrorata. LECTOTYPE ♀, here designated, labelled: 918; *D. irrorata* Pack. Maine. Packard Coll.; Type 14704; *Dryopteris irrorata* Pack., one of my type sp. . . .!, Mus. Peab. Acad. In the Museum of Comparative Zoology, Cambridge, U.S.A.

Other material. *B.M. (N.H.)* CANADA: *ex*. from Quebec Province, Ontario, Manitoba. U.S.A.: *ex*. from New Hampshire, New York State, N. Carolina, Florida, Texas. *C. Kimball Collection*. U.S.A.: 7 *ex*., Florida; 2 *ex*. Massachusetts. *Bryant Mather Collection*. U.S.A.: 3 *ex*. S. Mississippi. *U.S.N.M.* U.S.A.: 1 *ex*., Florida.

Oreta pulchripes Butler **comb.rev.**

(Text-figs. 6-8)

Oreta pulchripes Butler, 1877 : 477.

Oreta pulchripes Butler; Gaede, 1931 : 45.

Psiloreta pulchripes (Butler) Inoue, 1956 : 370.

Psiloreta pulchripes (Butler); Inoue, 1959 : 175. [Good figs.]

Psiloreta pulchripes (Butler); Inoue, 1962 : 40. [Good figs. of moth and genitalia.]

Oreta calceolaria Butler, 1877 : 477. [Synonymized by Inoue, 1956 : 370.]

Oreta auripes Butler, 1879 : 355. [Synonymized by Inoue, 1956 : 370.]

Oreta thermidora Hampson, 1914 : 104. [Synonymized by Inoue, 1956 : 370.]

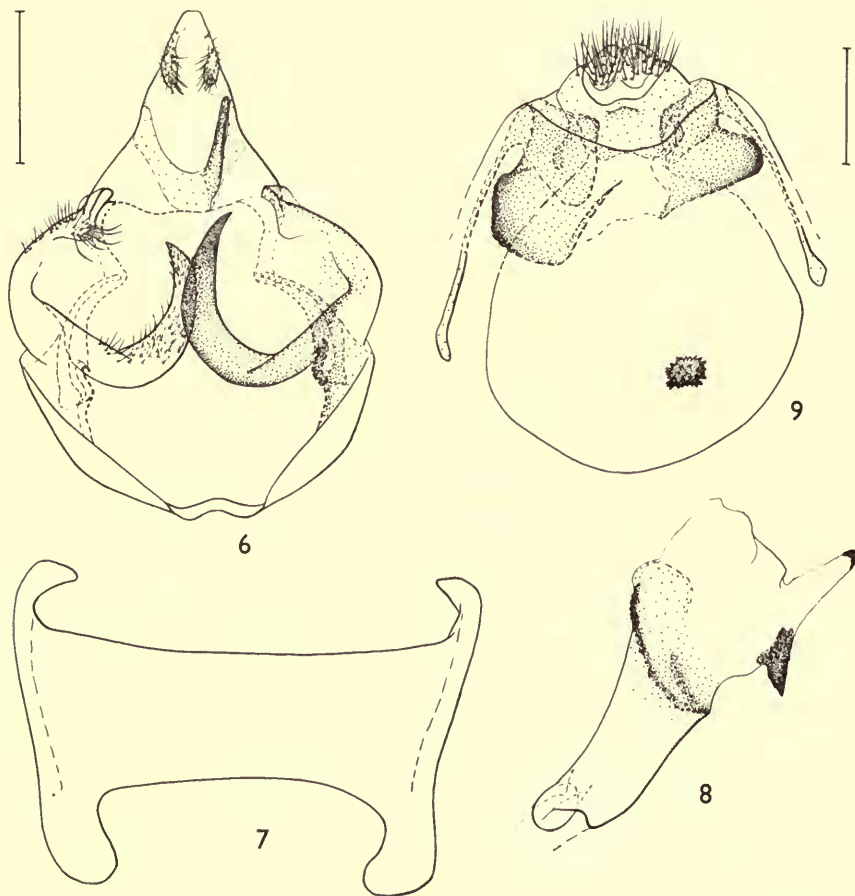
Oreta pulchripes chosenoreta Bryk, 1949 : 28. [Synonymized by Inoue, 1956 : 370.]

This species has recently been fully discussed and illustrated in colour by Dr. H. Inoue (1956, 1959, 1962), but for purposes of comparison the genitalia are re-illustrated (Text-figs. 6-8).

The yellow-and-brown form of *pulchripes* is externally similar to the corresponding form of *liensis* sp.n., whereas the brown form closely resembles the brown form of *loochooana* Swinhoe. Both *liensis* and *loochooana* differ from *pulchripes* in the less strongly convex outer margin of the fore wing, and *loochooana* can be distinguished

by the non-angulate postmedial fascia on the fore wing. The overall specific affinities of *pulchripes* are doubtful. The ♂ genitalia of *turpis* Butler have much in common with those of *pulchripes*, although the ♀ genitalia do not indicate particularly close affinities between these two species. *O. rosea* is externally very close to *pulchripes*.

Wing. ♂ 15.0-21.0 mm. (5); ♀ 17.0-24.0 mm. (30).



FIGS. 6-8. *Oreta pulchripes* genitalia. 6, ♂; 7, ♂ eighth abdominal sternite; 8, aedeagus; 9, ♀.

The ratio of yellow-and-brown to brown specimens in the material examined is 117 : 121.

Distribution. The B.M. (N.H.) collection contains specimens from S.E. RUSSIA, and JAPAN. Inoue (1959) lists S.E. RUSSIA, KOREA, JAPAN (including Amamioshima) and CHINA. No Chinese specimen of *pulchripes* has been seen during the present

study but there is good reason to expect at least accidental occurrences of this species inside the Manchurian border of China, especially near Vladivostock where *pulchripes* is known to occur. The Höne collection at the Museum Koenig, Bonn, contains only Japanese examples.

Type material.

pulchripes. LECTOTYPE ♂, in B.M. (N.H.), here designated, labelled : 77.9 [B.M. registration 1877.9 : Japan, Yokohama (*Jonas*)] ; *Oreta pulchripes* Butler Type ; Drepanidae genitalia slide No. 522.

calceolaria. LECTOTYPE ♂, here designated, labelled : 77.9 [Yokohama (*Jonas*)] Japan ; *Oreta calceolaria* Butler Type. In B.M. (N.H.).

auripes. LECTOTYPE ♀, here designated, labelled : Japan, 79.48 [Yokohama], 348 ; *Oreta auripes* Butler Type. In B.M. (N.H.).

thermidora. Holotype ♀. Japan, Fushiki, vii. 1886 (*Leech*) ; Drepanidae genitalia slide No. 521. In B.M. (N.H.).

chosenoreta. Holotype ♀. Korea, Shuotsu, 22.vii. In the Naturhistoriska Riksmuseet, Stockholm.

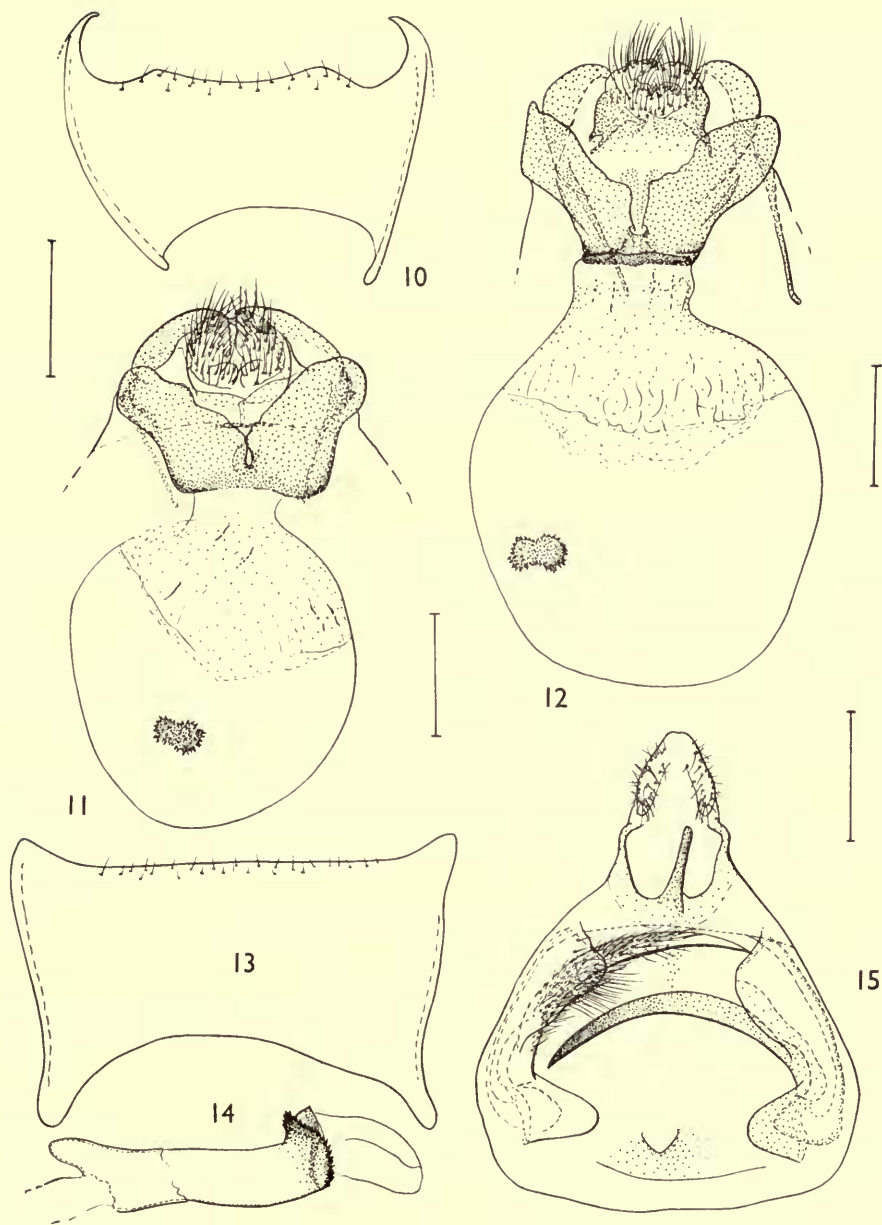
Oreta loochooana Swinhoe **comb. rev.**

(Text-figs. 10-15)

Both sexes of this species have been illustrated recently in colour by Inoue (1962 : Pl. 3, figs. 59, 60). The colour-pattern of *loochooana* is most like that of *paki* Inoue, but the two discocellular spots on the fore wing are usually more clearly defined than in *paki*. In wing shape *loochooana* can be separated from *paki* by the less strongly falcate apex and the weakly convex outer margin of the fore wing and by the evenly convex, not sinuous, outer margin of the hind wing. The similarity in the shape of the aedeagus and general similarity in the colour-pattern and most parts of the genitalia suggest phyletic affinities between *loochooana* and *hoenei* (Text-figs. 23-31) (especially *hoenei inangulata*) from which *loochooana* differs externally in the fore wing, by the less strongly falcate apex, the more distinctly marked tornal markings and the lighter yellow postmedial fascia.

Two colour-forms exist in this species, corresponding to the yellow-and-brown and brown forms of *pulchripes*.

Two subspecies are known : the nominate subspecies from China (Shantung), Formosa and Japan (Ryukyu Archipelago), and *timutia* ssp. n. from China (see below). The single example of the nominate subspecies from Shantung calls for confirmation and further investigation, as the Chinese province of Fukien which faces Formosa across the Taiwan Straits forms part of the known range of subspecies *timutia* and no connecting populations are yet known to occur in Korea which could form a link between the Ryukyu and Shantung elements of the nominate subspecies.



FIGS. 10-15. *Oreta* genitalia. 10-11, *loochooana timutia*. 10, ♂ eighth abdominal sternite; 11, ♀. 12-15, *loochooana loochooana*. 12, ♀; 13, ♂ eighth abdominal sternite; 14, aedeagus, 15, ♂.

***Oreta loochooana loochooana* Swinhoe**

(Text-figs. 12-15)

Oreta loochooana Swinhoe, 1902 : 591.*Oreta pulchripes loochooana* Swinhoe; Strand, 1911 : 205.*Oreta pulchripes* var. *loochooana* Swinhoe; Gaede, 1931 : 46.*Psiloreta loochooana* (Swinhoe) Warren, 1923 : 485.*Psiloreta loochooana* (Swinhoe); Gaede, 1931 : 48.*Psiloreta loochooana* (Swinhoe); Inoue, 1962 : 38. [Good figs.]*Oreta (Oretella) squamulata* Strand, 1916 : 164. **syn. n.***Psiloreta pulchripes formosicola* Matsumura, 1927 : 46. **syn. n.**

There appears to be no external difference between this subspecies and *timutia*. In the ♂ genitalia the eighth sternite is differently shaped, and in the ♀ the ostial segment differs in the shape of the sclerites.

Wing. ♂ 15.0-20.5 mm. (17); ♀ 20.5-22.5 mm. (2).

Eight ♂ and one ♀ of the yellow-and-brown form, and nine ♂ and one ♀ of the brown form have been examined.

Distribution. FORMOSA, JAPAN (Ryukyu archipelago).

Type material.

loochooana. LECTOTYPE ♂, here designated from the series of four ♂ syntypes in B.M. (N.H.), labelled: Loochoo, 1896, H. Pryer Coll.; Leech Coll. 1900-64; *Oreta loochooana* Swinh. ♂ type; Drepanidae genitalia slide No. 616. Paralectotypes. JAPAN : 3 ♂, Loochoo, 1896 (*Pryer*).

squamulata. Holotype ♂. [Formosa] Kosempo, xi. 1911 (*Sauter*); Drepanidae genitalia slide No. 828. In the Deutsches Entomologisches Institut, Berlin.

formosicola. Holotype ♀. Horisha [Formosa] (*Takamuku*) [Examined for me at Hokkaido University by Dr. T. Kumata at the request of Dr. H. Inoue].

Other material. Examples from FORMOSA, JAPAN (Ryukyu Archipelago, Amami-shima, Okinawa), in the collections of B.M. (N.H.), Dr. H. Inoue and Dr. F. Daniel. One ♂ from CHINA (Shantung) in B.M. (N.H.), possibly erroneously labelled.

***Oreta loochooana timutia* ssp. n.**

(Text-figs. 10-11)

As stated earlier, external separation of the two subspecies of *loochooana* is probably not possible. The subspecies can be separated in the ♂ by the shape of the eighth tergite and in the ♀ by the structure of the ostial segment.

Wing. ♂ 16.5-19.0 mm. (46); ♀ 19.6-20.5 mm. (2).

The ratio of the number of specimens of the yellow-and-brown form to the number of brown specimens in the material examined is 30 : 23. Both females belong to the yellow-and-brown form of the species.

Distribution. CHINA (Szechwan, Kwangtung, Hunan, Chekiang, Fukien).

Holotype ♂. Hunan, Hoeng-shan, 900 m., 28.iv.1933 (*Höne*); Drepanidae genitalia slide No. 1545. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA: 3 ♂, Kwangtung, Linping, iii-iv.1922 (*Höne*); 15 ♂, type-locality, 25.iv-10.ix.1933 (*Höne*); 7 ♂, Chekiang, East and West Tien-mu-shan, 22.v-26.ix.1931, 18.iv-29.ix.1932 (*Höne*); 1 ♂, Chekiang, East Tien-mu-shan, near Langan, 1500 m., 27.v.1931 (*Höne*); 9 ♂, 1 ♀, Fukien, 5.iv-12.vi.1938, 9.v-14.vi.1946 (*Klapperich*); 2 ♂ [? Kiangsi] Kuling, 9.v.1931, 2.v.1934 (*Höne*).

***Oreta turpis* Butler comb. rev.**

(Text-figs. 16-19)

Oreta turpis Butler, 1877 : 477.

Oreta turpis Butler; Gaede, 1931 : 47.

Psiloreta turpis (Butler) Inoue, 1959 : 175. [Good figs.]

Psiloreta turpis (Butler); Inoue, 1962 : 39. [Good figs.]

Oreta calida Butler, 1877 : 477. [Synonymized with *turpis* by Inoue, 1956 : 370.]

Oreta calida Butler; Strand, 1911 : 205. [Fig.]

Oreta calida Butler; Gaede, 1931 : 43.

A comprehensive account of this species has been given recently by Inoue (1962 : 39). It is externally close to *trispina* sp.n. (brown form), *pulchripes* Butler (brown form) and *hoenei tienia* ssp. n.; though it is probably most like the brown form of *trispina* (Pl. 2, fig. 99) which, however, has more strongly falcate fore wings, a more strongly sinuous outer margin to the hind wing, and a broadly divided cell-patch on the fore wing. On the basis of overall similarity, *paki* Inoue is the closest ally of *turpis*. The latter can be distinguished from *paki* by the absence of spots at the anal angle of the fore wing, the strongly marked transverse fasciae, and by several differences in the genitalia of both sexes (see Text-figs. 16-19).

Wing. ♂, ♀. 13.0-20.0 mm. [*teste* Inoue, 1962 : 40].

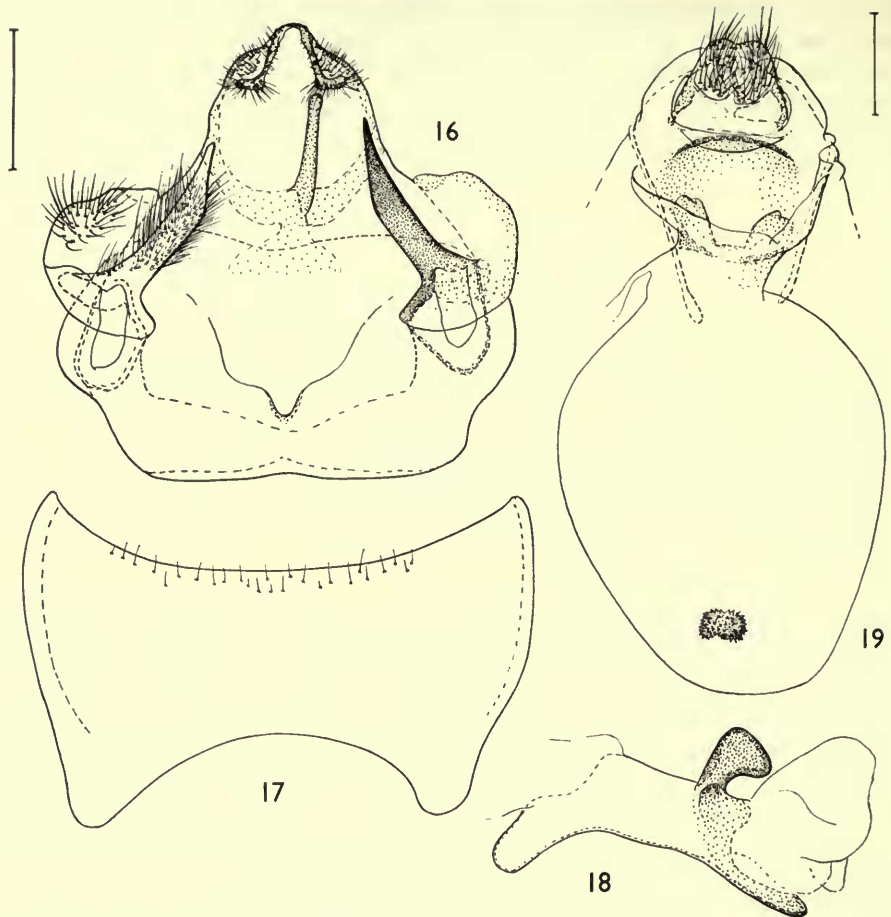
No equivalent of the yellow-and-brown form of, for example, *paki* is known to occur in *turpis*.

Distribution. JAPAN [see Inoue references above], U.S.S.R. (Sakhalin, Ussuri), KOREA [*teste* Inoue, 1959 : 175]. A male specimen labelled Tsingtau [CHINA, Shantung, Tsingtao], in the Museum Koenig, Bonn, is doubtless conspecific with the type of *turpis* but differs in the proportions of the valve processes and the aedeagus and may well represent a new subspecies of *turpis*.

Type material.

turpis. LECTOTYPE ♂, here designated, labelled : 77.9 Japan; *Oreta turpis* Butler Type; Drepanidae genitalia slide No. 519. The restricted type-locality is Yokohama as indicated in registration No. 1877-9 [77.9] in the records of the Department of Entomology, B.M. (N.H.). Type in B.M. (N.H.).

calida. LECTOTYPE ♂, here designated, labelled : 77.9 Japan [Yokohama]; *Oreta calida* ♂ Butler Type; Drepanidae genitalia slide No. 518. Lectotype, and a ♀ paralectotype from the type locality, in B.M. (N.H.).



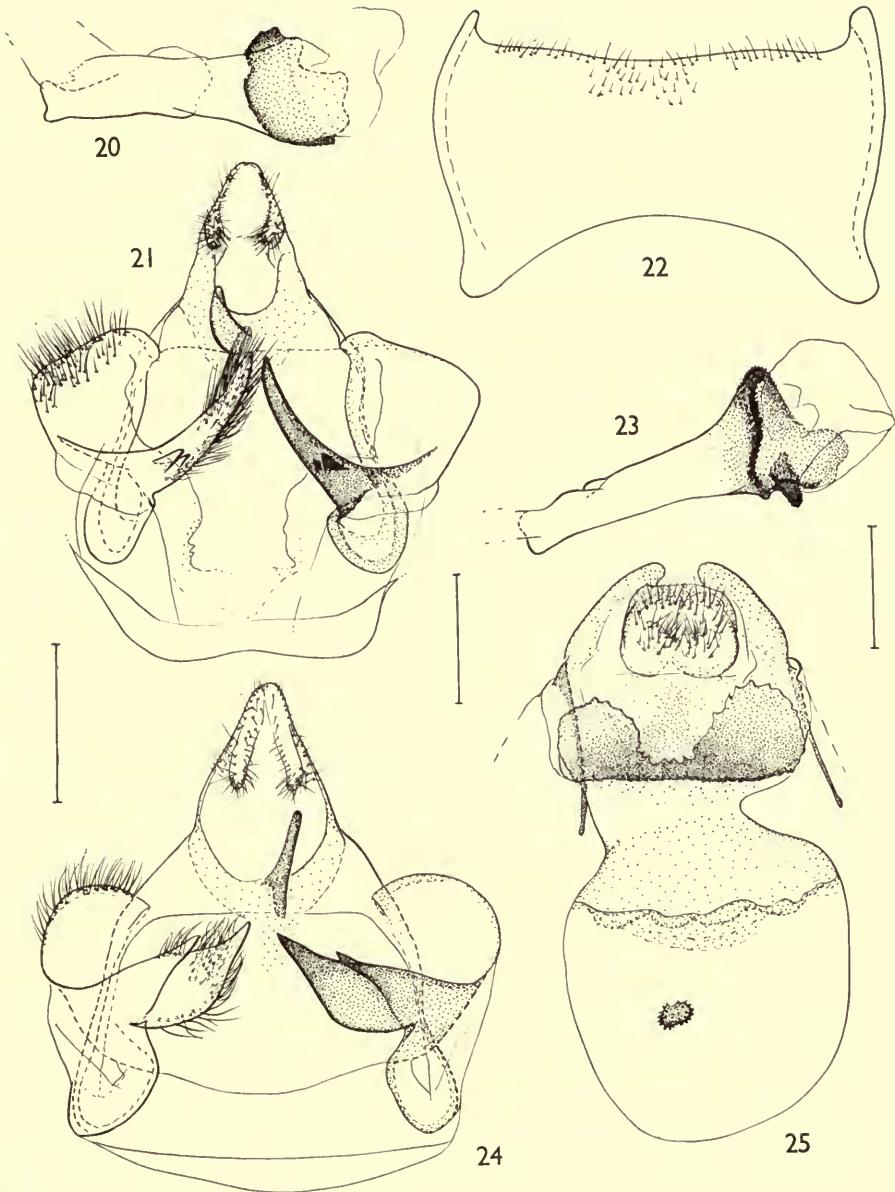
FIGS. 16-19. *Oreta turpis* genitalia. 16, ♂; 17, ♂ eighth abdominal sternite; 18, aedeagus; 19, ♀.

***Oreta paki* (Inoue) comb. n.**

(Text-figs. 20-22)

Psiloreta paki Inoue, 1964 : 3. [Good figs.]

As indicated by Inoue (1964 : 3-4), this species has close affinities with *turpis* Butler, from which it can be distinguished by the presence of one or two dark spots near the anal angle of the fore wing, the poorly marked antemedial and postmedial fasciae on the hind wing, and by differences in the ♀ genitalia and the shape of the valve processes, uncus, gnathos, aedeagus and eighth sternite in the ♂ genitalia. The affinities between *paki*, *lochooana* Swinhoe and *hoenei* sp.n. are probably less close than between *paki* and *turpis*, on the evidence of the total of genitalic and external characters. The external similarity between *paki* and *hoenei* (n nominate



FIGS. 20-25. *Oreta* genitalia. 20-22, *paki*. 20, aedeagus; 21, ♂; 22, ♂ eighth abdominal sternite. 23-25, *hoenei hoenei*. 23, aedeagus; 24, ♂; 25, ♀.

subspecies and *inangulata*) is close, but the ♀ genitalia and several features in the aedeagus, eighth sternite and main body of the ♂ genitalia readily distinguish these two species.

Wing. ♂ 17.5–21.0 mm. (21).

Of the 52 specimens examined by Inoue, 17 belonged to the yellow-and-brown form of the species (Inoue, 1964 : figs. 3–4) and the remainder to the brown form.

Distribution. KOREA. (See Inoue, 1964 : 4.)

Type material.

Holotype ♂. Korea, Seoul, Chungrangri, 7.vi.1961 (*S. W. Pak*). In B.M. (N.H.). [Recently kindly presented, together with five paratypes, by Dr. H. Inoue.]

Other material. There is a single male from "Utikongo im Kongosan (Mittel-Korea)" in the Museum Koenig, Bonn, and further examples from Seoul (collected by Pak) in the Daniel Collection, Munich.

Oreta hoenei sp. n.

(Pl. 1, figs. 93–96 ; Text-figs. 23–31)

♂. Palp and clypeofrons dull scarlet, vertex buff; antennae closely lamellate. Collar buff dorsally; dull scarlet lateral and ventral to eyes.

Thorax buff or reddish brown dorsally; chiefly pale buff ventrally, but dull scarlet anteriorly. Legs dull scarlet and buff on front or outer surface, otherwise pale buff. Outer margin in fore wing moderately or strongly convex. Outer margin of hind wing evenly convex in *inangulata*, weakly sinuous in nominate subspecies, and strongly sinuous in *tienia*. Coloration of upper surface of wings variable. In the nominate subspecies and *inangulata* the wings may be uniformly reddish brown with little trace of the medial shade, brown with darker brown medial shade, varying shades of brown with the distal half of the hind wing bright yellow, or less frequently intermediate between these three categories. In *hoenei tienia* neither uniformly reddish brown nor yellow and brown specimens have been seen. The under surface of the wings corresponds approximately to the colour-pattern and coloration of the upper surface except that the antemedial fascia is absent and that, except for *tienia*, the postmedial fascia is poorly defined. Abdomen pinkish buff ventrally, laterally and posterodorsally, but similar to colour of base of hind wing anterodorsally.

♂ genitalia as in Text-figs. 23, 24, 26, 27, 30, 31.

♀. As for male but outer margin of fore wing more strongly convex.

♀ genitalia (Text-figs. 25, 28, 29) with emarginate ostial plate.

The closest allies of *hoenei* appear to be *turpis* Butler or *paki* Inoue. The latter is externally similar in colour-pattern and coloration to the nominate subspecies and *hoenei inangulata*, whereas *turpis* approaches *hoenei tienia* in these respects. The ♂ and ♀ genitalia of both *turpis* and *paki* indicate close affinities between them and *hoenei*. There are similarities in the colour-pattern between *hoenei* and *loochooana*, another widespread Chinese species, but the genitalia readily separate them.

Three subspecies can be distinguished: *inangulata* (Tibet, Szechwan, Yunnan); the nominate subspecies (Shansi, Shensi) and *tienia* (Chekiang). The species is unknown outside China.

***Oreta hoenei hoenei* ssp. n.**

(Pl. 1, figs. 93, 94 ; Text-figs. 23-25)

This subspecies differs externally from *inangulata* in the more strongly convex outer margin of the fore wing and the sinuous outer margin of the hind wing, and from *tienia* by the generally less strongly convex outer margin of the fore wing, the weakly sinuous outer margin of the hind wing, and the usually less strongly marked antemedial and postmedial fasciae on the upper surface of both wings. In the ♂ genitalia the shape of the valve process and the terminal part of the aedeagus (Text-figs. 23, 24) distinguish this subspecies from *inangulata* and *tienia*. The shape of the ♀ ostial sclerites separates the nominate subspecies from *tienia* and *inangulata*.

Wing. ♂ 18.0-22.0 mm. (73); ♀ 21.5-23.5 mm. (4).

Of the 73 males and four females examined, seven males and one female have clear yellow hind wings distal to the medial shade (yellow-and-brown form); the hind wings of the remainder are either uniformly brown or have the distal part of the wing a paler brown (yellowish brown in a few specimens) than the medial shade.

Distribution. CHINA (Shansi, Shensi).

Holotype ♂. S. Shensi, Tapaishan im Tsinling, 1,700 m., 13.viii.1936 (*Höne*); Drepanidae genitalia slide No. 1554. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA: 52 ♂, 1 ♀, type-locality, 20.vi-26.ix.1935, 17.v-17.viii.1936 (*Höne*); 13 ♂, Shansi, Mienshan, 2000 m., 3.vi-12.viii.1937 (*Höne*). *B.M. (N.H.).* CHINA: 9 ♂, 2 ♀, type-locality, 16-21.ix.1935, 7.vi-21.viii.1936 (*Höne*); Shansi, Mienshan, 2,000 m., 2.vii-6.viii.1937 (*Höne*). *Daniel Collection, Munich.* CHINA: 2 ♂, type-locality, 26.ix.1935, 19.viii.1936 (*Höne*); 3 ♂, Shansi, Mienshan, 2,000 m., 1.vii-10.viii.1937 (*Höne*).

***Oreta hoenei inangulata* ssp. n.**

(Pl. 1, fig. 95 ; Text-figs. 26-28)

Separable from both the nominate subspecies and *tienia* by the weakly convex outer margin of the fore wing, the evenly convex, non-sinuous margin of the hind wing, the shape of the valve processes and aedeagus in the ♂, and by the shape of the paired processes of the ostial segment in the ♀ genitalia.

Wing. ♂ 18.0-24.0 mm. (26); ♀ 22.0-22.5 mm. (2).

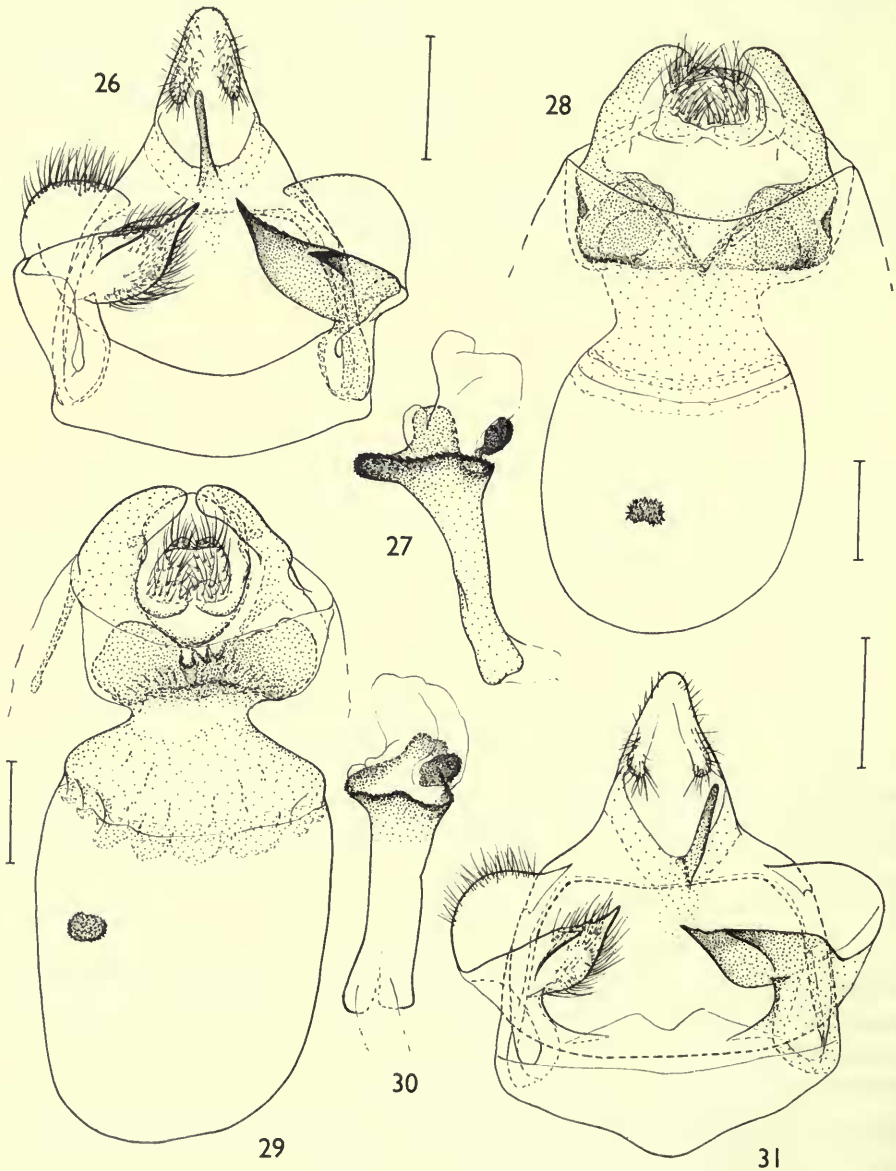
Of the 28 specimens examined, four (including one ♀) represent the yellow-and-brown form of the species (Pl. 1, fig. 95), and 23 the brown form in which the hind wing is almost uniformly brown. One specimen in the Museum Koenig is brown but with some yellow scaling on the fore wing.

Distribution. CHINA (Szechwan, Yunnan).

Holotype ♂. N. Yunnan, Likiang, 30.viii.1935 (*Höne*); Drepanidae genitalia slide No. 1556. In the Museum Koenig, Bonn.

Paratypes. *B.M. (N.H.).* CHINA: 7 ♂, 1 ♀, Szechwan, Kwanhsien, vii.1924, 1930 (*Franck et al.*); 1 ♂, Szechwan, Kia-ting-fu, vi-vii.1890; 2 ♂, Szechwan,

Suifu; 1 ♂, Szechwan, Mt. Omei, Shinkaisi, 4400 ft.; 1 ♂, Szechwan, Tatsienlou, 1895; 1 ♂, Szechwan, Kwanhsien, 9.viii.1926 (*Franck*). YUNNAN: 5 ♂, type-locality, 7.viii-1.x.1934, 5, 13.ix.1935 (*Höne*); 1 ♀, China. *Museum Koenig, Bonn*. YUNNAN: 7 ♂, type-locality, 25.vii-6.ix.1935 (*Höne*).



FIGS. 26-31. *Oreta* genitalia. 26-28, *hoenei inangulata*. 26, ♂; 27, aedeagus; 28, ♀; 29-31, *hoenei tienia*. 29, ♀; 30, aedeagus; 31, ♂.

***Oreta hoenei tienia* ssp. n.**

(Pl. 1, fig. 96 ; Text-figs. 29-31)

Separated from *angulata* and the nominate subspecies by the more strongly convex outer margin of the fore wing, the strongly sinuous outer margin of the hind wing and the usually strongly marked transverse fasciae on both wings. The shape of the valve processes and aedeagus are diagnostic in the ♂ genitalia and in the ♀ the shape of the ventral lip of the ostium distinguishes *tienia* from the nominate subspecies. Externally *tienia* resembles *trispina* sp.n. (Pl. 2, figs. 98, 99), except that on the fore wing the postmedial fascia is less well marked, the cell-patch is not interrupted at the distal end of the cell and there is a diffuse brown batch at the tornus. The genitalia of *trispina* show, however, that it cannot be placed in the same species-group of *hoenei*.

Wing. ♂ 17.5-21.0 mm. (31); ♀ 20.5-24.0 mm. (4).

No specimen of the yellow-and-brown form of the species has been seen. The ground-colour of the upper surface varies from reddish brown to pale buff.

Distribution. CHINA (Chekiang).

Holotype ♂. China, Chekiang, West Tien-mu-shan, 31.v.1932 (*Höne*) ; Drepanidae genitalia slide No. 1563. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA : 28 ♂, 2 ♀, type-locality, 26.v-7.x.1932 (*Höne*) ; 2 ♂, East Tien-mu-shan, 15.vi, 3.ix.1931 (*Höne*). *B.M. (N.H.)*. CHINA : 6 ♂, 2 ♀, type-locality, 2.vi-12.ix.1932 (*Höne*) ; 1 ♂, East Tien-mu-shan, 13.vi.1931 (*Höne*). *Daniel Collection, Munich.* CHINA : 5 ♂, 1 ♀, type-locality, 24.v-13.vi.1932 (*Höne*).

***Oreta shania* sp. n.**

(Pl. 2, fig. 97 ; Text-figs. 32-35)

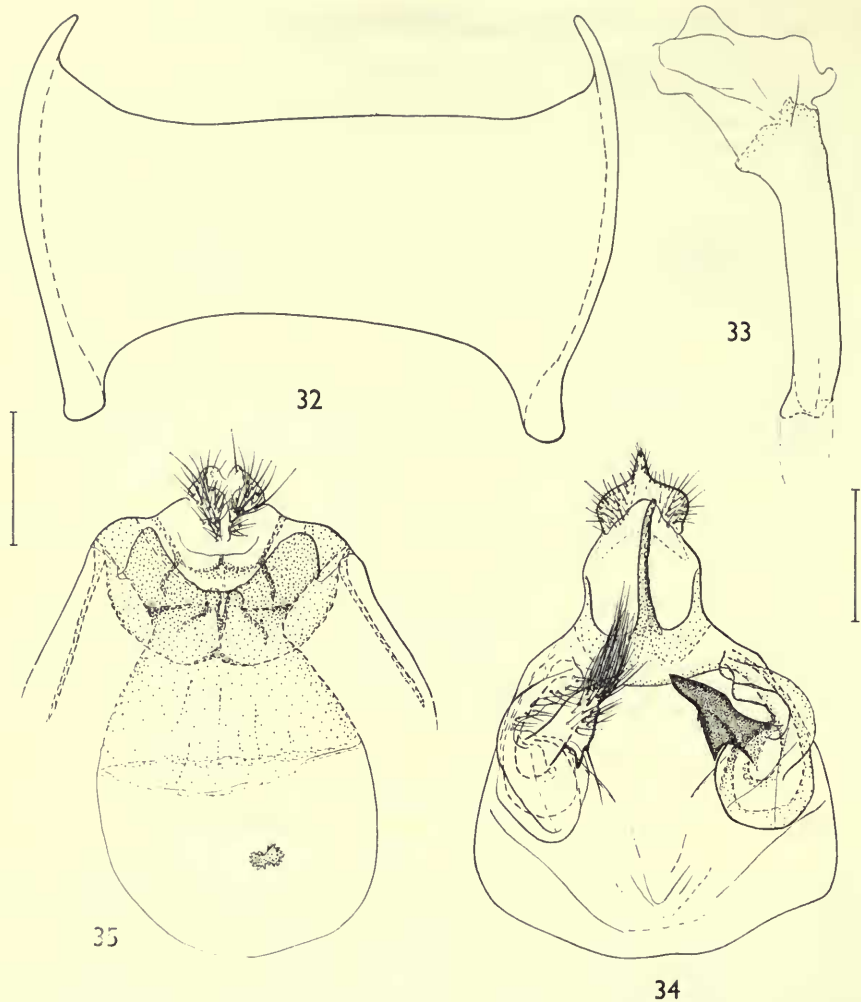
♂. Palp dull scarlet. Clypeofrons orange-brown, but with scarlet tuft anterior to base of each antenna; vertex dull yellow. Antennae closely lamellate, yellow near base, yellowish brown distally. Collar yellow dorsally, dull scarlet laterally and ventrally.

Thorax yellow dorsally, palest anteriorly; paler yellow ventrally. Outer surface of fore legs orange-buff and dull scarlet; outer surface of tibia and tarsus of mid and hind legs mainly orange-buff but with pink fringe to tibia and dull scarlet band at distal margin of each tarsal segment. Inner surface of legs pale buff.

Wing shape as in Pl. 2, fig. 97. R_1 in fore wing arises from distal end of cell (in most specimens) or from the proximal end of the areole. $Sc + R_1$ in hind wing approximates to R_s distal to end of cell.

Colour-pattern of upper surface of wings as in Pl. 2, fig. 97. Pale areas yellow, darker medial or marginal areas reddish brown and usually well-marked; both wings with two white cell-spots; black or dark brown spots on costa and at anal angle on $1A$ and Cu_{1b} (trace). Both wings, but especially hind wing, lightly speckled with black or dark brown in a large proportion of specimens. Under surface of fore wing pale brownish orange, or deep yellow partly diffused with dark pink heavily speckled with dark brown; well-marked, dark brown postmedial fascia, and pale grey area immediately posterior to apex. Anterior margin of under surface of hind wing as for fore wing, but yellow posterior to cell with light speckling of dark brown.

Dorsal surface of abdomen as for adjacent surface of hind wing: yellow, transversed by pale reddish brown band. Ventral surface pale buff but with longitudinal orange band on either side along lateral border of sternites.



FIGS. 32-35. *Oreta shania* genitalia. 32, ♂ eighth abdominal sternite; 33, aedeagus; 34, ♂; 35, ♀.

♂ genitalia as in Text-figs. 32-34. There is some minor variation in the dentation of the inner margin of the valve processes.

♀. As for ♂ but with outer margin of fore wing more strongly convex.

♀ genitalia as in Text-fig. 35.

Wing. ♂ 15.0-20.5 mm. (79); ♀ 19.5 mm. (1).

No polymorphism in upper surface wing coloration is present in the available material, in contrast with the variation found in related species of this species-group (e.g. *hoenei* and *loochooana*, both of which occur in China).

The precise affinities of *shania* within its species-group are uncertain. It is externally most like *loochooana* Swin., which has a similar distribution in China but differs from *shania* in the much broader medial shade on both wings.

Distribution. CHINA (Chekiang, Fukien, Szechwan).

Holotype ♂. China, Chekiang, West Tien-mu-Shan, 1.vii.1932 (*Höne*); Drepanidae genitalia slide No. 1548. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA: 42 ♂, type-locality, 9.vi-8.vii.1932 (*Höne*); 3 ♂, East Tien-mu-Shan, 4.vi-17.vi.1931 (*Höne*); 4 ♂, East Tien-mu-Shan, Lingan, 1500 m., 31.v-17.vi.1931; 15 ♂, Fukien, Kuatun, 2300 m., 16.v-1.vi.1938 (*Klapperich*), 10.vii-4.viii.1938 (*Höne*). *B.M. (N.H.)*. CHINA: 6 ♂, type-locality, 17-23.vi.1932 (*Höne*); 2 ♂, East Tien-mu-shan, 10, 13.vi.1931 (*Höne*); 3 ♂, Fukien, Kuatun, 2300 m., 13, 17.v.1938, 25.v.1946 (*Klapperich*); 12 ♂, Szechwan, Kwansien, 17.vii.1924, 21.vii.1925, vii-viii.1930 (*Franck* and others); 1 ♂, Szechwan, Tien-tsuen, 1897; 5 ♂, 1 ♀, Szechwan, 1900-1902; 1 ♂, Szechwan, Moupin, 1897. *Daniel Collection.* CHINA: 5 ♂, type-locality, 1,600 m., 11-23.vi.1932 (*Höne*).

Oreta trispina sp. n.

(Pl. 2, figs. 98, 99; Text-figs. 36-39)

♂. Antennae closely lamellate, buff in colour. Palp orange. Clypeofrons orange, vertex buff. Collar pale buff dorsally, orange ventrally and lateral to eyes.

Dorsal surface of thorax yellowish or reddish brown, ventral surface pale buff. Outer surface of femur of fore leg and tibia of each leg with vestiture of buff and orange scales; tarsal segments orange distally, buff proximally; legs otherwise pale buff.

*R*₁ arises from near base of areole in the fore wing. Shape of wings as in Pl. 2, figs. 98, 99. Ground-colour of upper surface of wings either entirely reddish brown (Pl. 2, fig. 99) as in holotype, or reddish brown with pale yellow band on fore wing and broad, distal, pale yellow area on hind wing (Pl. 2, fig. 98). Wing markings mostly dark brown or black and moderately lustrous, with yellow distal edge to oblique postmedial fascia on fore wing and non-lustrous yellowish brown cell-patch on fore wing. Pattern of under surface as for upper surface but without antemedial fasciae or cell markings. Ground-colour pale orange (where upper surface is brown) or yellow (where upper surface is yellow). Markings orange, except for dark brown postmedial fascia of fore wing edged distally with white scales near apex.

♂ genitalia (Text-figs. 36-38): usually not bilaterally symmetrical in that the saccular spines of the valve are not identically shaped or directed on each side of the genitalia; terminal process of aedeagus flattened laterally.

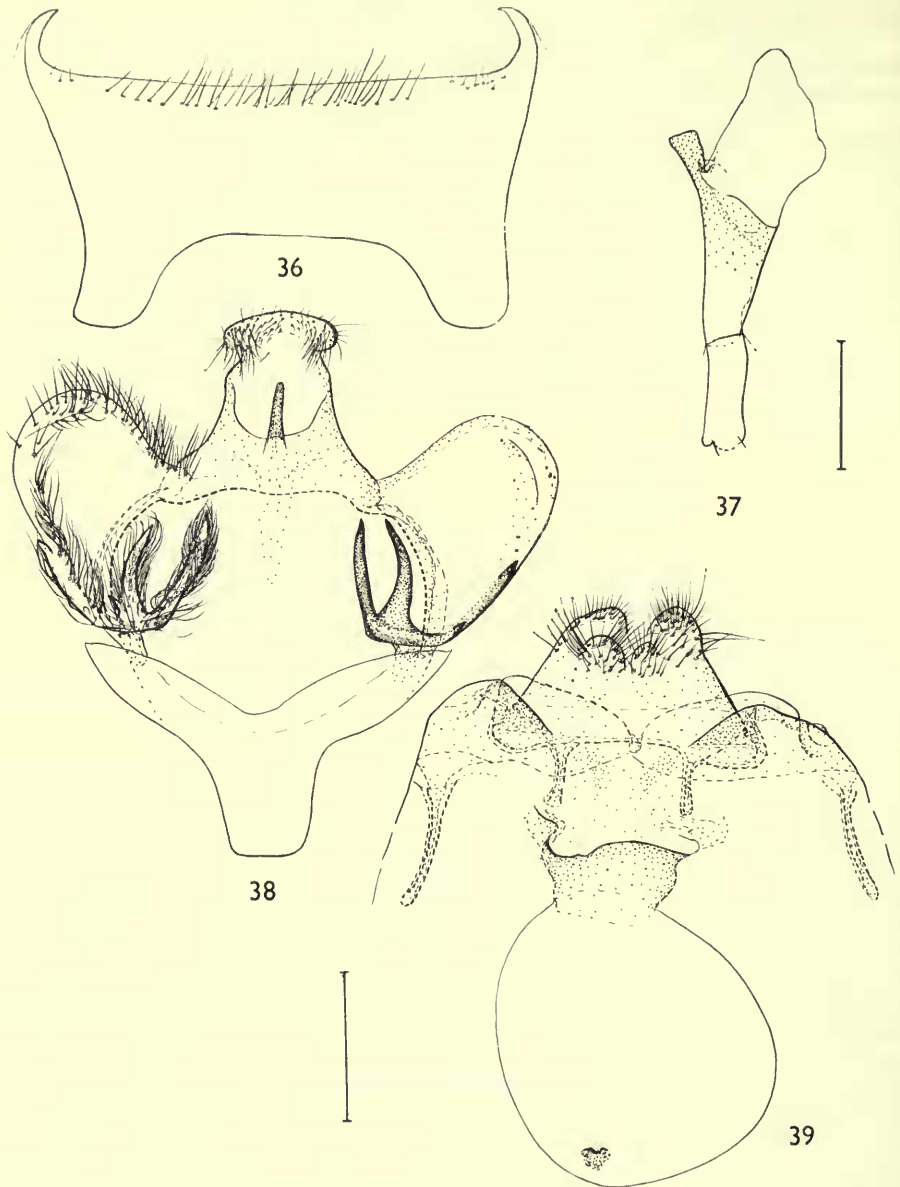
♀. As for ♂ but outer margin of fore wing more strongly convex at middle.

♀ genitalia as in Text-fig. 39.

Wing. ♂ 18.5-23.5 mm. (27); ♀ 22.5-25.0 mm. (4).

Of the 32 specimens examined 25 represented the yellow-and-brown form of the species and 7 of the brown form (see description above).

This species is probably most closely allied to *liensis* (Pl. 2, fig. 100) from which it can be distinguished externally by the more strongly falcate fore wing, the sinuous hind wing margin, the well-marked postmedial fascia and cell-patch on the fore wing, and by the absence of a dark marking at the anal angle of the fore wing. The number and shape of the valve processes, the size of the uncus and the shape of the terminal process of the aedeagus provide the chief diagnostic feature in the ♂ geni-



FIGS. 36-39. *Oreta trispina* genitalia. 36, ♂ eighth abdominal sternite; 37, aedeagus; 38, ♂; 39, ♀.

talia. In wing shape, coloration and colour-pattern *hoenei tienia* (Pl. I, fig. 96) is similar to *trispina* except that on the fore wing of *tienia* the postmedial fascia is less strongly marked, the cell marking is not interrupted at the discocellular vein, and there is a dark marking at the anal angle. Numerous features in both the ♂ and ♀

genitalia show, however, that *hoenei* is more closely allied to the group of species which includes the Chinese *shania* and the more widespread *loochooana*.

Distribution. CHINA (Szechwan and Shensi).

Holotype ♂. S. Shensi, Tapaishan im Tsinling, 6.vii.1935 (*Höne*); Drepanidae genitalia slide No. 1559. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA: 12 ♂, type-locality, 1700 m., 3000 m., 21.vii-13.viii.1935 (*Höne*). *B.M. (N.H.)*. CHINA: 4 ♂, type-locality, 1000 m., 1700 m., 26,27.vii.1935, 20.vii-30.viii.1936 (*Höne*); 3 ♂, 2 ♀, Szechwan, Tu-pa-keo, 7400 ft., 28.viii-4.ix.1929 (*Kelley-Roosevelt Expedition*); 1 ♂, 1 ♀, Szechwan, Tien-Tsuen, 1903 (*Déjean*); 1 ♂, 1 ♀, Szechwan, Ta-t sien-lou, 1906, 1910; 1 ♂, Szechwan, Siao-lou, 1903 (*Déjean*); 1 ♂, Szechwan, Beh Lui Din (30 miles N. of Chengtu). *Daniel Collection, Munich.* CHINA: 3 ♂, type-locality, 1700 m., 21-29.vii.1935, 7.viii.1936 (*Höne*).

Oreta liensis sp. n.

(Pl. 2, fig. 100; Text-figs. 40-42)

♂. Antenna closely lamellate, buff. Palp brownish orange. Clypeofrons brownish orange, vertex dark buff but with brownish orange tuft anterior to base of each antenna. Collar yellow dorsally, brownish orange ventrally and lateral to eyes.

Dorsal surface of thorax yellow at extreme anterior margin, followed by band of white-tipped scales (each scale with purplish brown pre-apical band); remainder of dorsal surface buff; ventral surface pale buff or pinkish buff. Colour of legs doubtful, probably as in *trispina*.

R_1 arises from near proximal end of areole in fore wing. Shape of wings as in Pl. 2, fig. 100. Colour-pattern of upper surface either as in Pl. 2, fig. 100 (dark areas reddish brown, pale areas yellow) or with yellow areas replaced by pale reddish brown. Marking at anal angle of fore wing nearly black; fore wing without dark, non-lustrous patch distal to end of cell. Under surface pattern of yellow and brown form as for upper surface, yellow areas similarly coloured but reddish brown areas of upper surface replaced by brownish pink. Under surface of brown form similar to previous form but with yellow areas replaced by buff.

♂ genitalia (Text-figs. 40-42): each valve with two spines; terminal process of aedeagus flattened laterally.

♀. Not known.

Wing. ♂ 19.5-21.0 mm. (9).

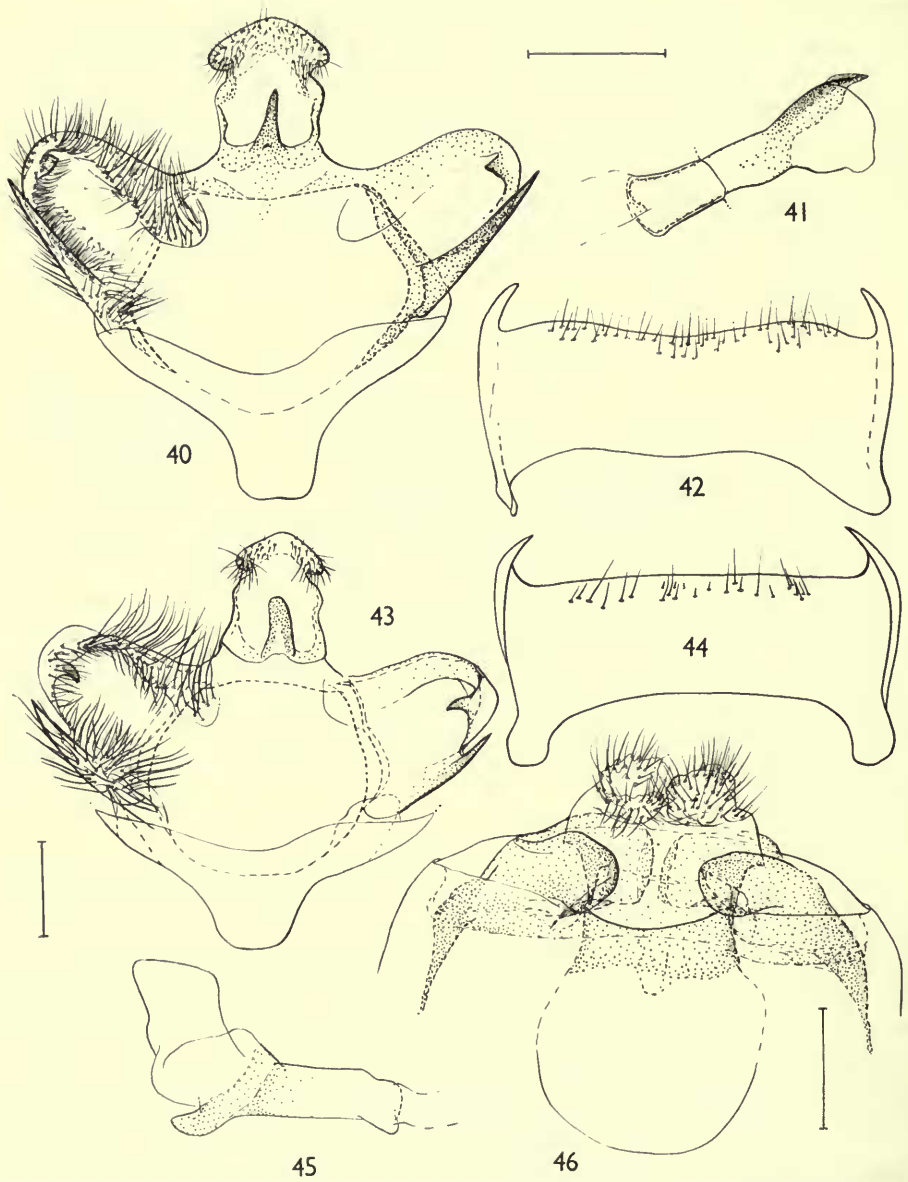
The ratio of yellow-and-brown specimens to brown specimens (see description) in the material studied was 8 : 1.

Probably most closely allied to *Oreta sanguinea* Moore, from which it can be separated by several distinct differences in coloration and colour-pattern and by the shape or size of the valve processes, gnathos and aedeagus in the male genitalia.

Distribution. CHINA (Yunnan).

Holotype ♂. N. Yunnan, Likiang, 1.ix.1935 (*Höne*); Drepanidae genitalia slide No. 1557. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn.* CHINA: 5 ♂, type-locality, 22.vii-2.ix.1935 (*Höne*). *B.M. (N.H.)*. CHINA: 2 ♂, type-locality, 14.viii, 8.ix.1935 (*Höne*); 1 ♂, Tibet, Ta-Ho, Spring 1895. *Daniel Collection, Munich.* CHINA: 1 ♂, type-locality, 1.ix.1935 (*Höne*).



FIGS. 40-46. *Oreta* genitalia. 40-42, *liensis*. 40, ♂; 41, aedeagus; 42, ♂ eighth abdominal sternite. 43-46, *sanguinea*. 43, ♂; 44, ♂ eighth abdominal sternite; 45, aedeagus; 46, ♀.

***Oreta sanguinea* Moore comb. rev.**

(Text-figs. 43-46)

Oreta sanguinea Moore, 1879 : 85.*Psiloreta sanguinea* (Moore) Warren, 1923 : 485. [Fig.]*Psiloreta sanguinea* (Moore); Gaede, 1931 : 49.

This is an easily recognizable brightly coloured species (see Warren, 1927, pl. 51c), separable from its close relative *liensis* by the brownish red or pink coloration of the medial shade on the upper surface of both wings and by the conspicuous black and grey areas at the apex and anal angle of the fore wing. In the ♂ genitalia, the shape and size of the valve processes and gnathos are particularly diagnostic (Text-fig. 43).

The ♀ genitalia are figured in Text-fig. 46.

Wing. ♂ 18.5-25.0 mm. (7); ♀ 22.5-27.0 mm. (5).

Distribution. N.E. INDIA, SIKKIM and CHINA (Tibet). Only one Chinese specimen is known, a male from Yatung, Tibet, which differs from the lectotype in details of the shape of the gnathos, valve and aedeagus and may prove to represent a new subspecies.

Type material.

LECTOTYPE ♂, here designated, labelled: Darjeeling; Moore Coll. 94-106; *Oreta sanguinea* (type) Moore; Drepanidae genitalia slide No. 1675. In B.M. (N.H.).

Paralectotypes. *Zoologisches Museum, Berlin*. N.E. INDIA : 2 ex., Darjeeling.

Other material. B.M. (N.H.). N.E. INDIA : 2 ♂, 2 ♀, Khasis, v. 1896 (1 ♂), Darjeeling (*Lidderdale*); SIKKIM : 2 ♂, 1 ♀, 25.iv-20.vii.1889 (*Möller, Pilcher*); 2 ♂, 7,000 ft., 1858 (1 ♂). CHINA : 1 ♂, Tibet, Yatung (*Hobson*).

***Oreta pavaca* (Moore) comb. rev.**

(Pl. 3, fig. 101, Text-figs. 47-54)

The coloration and colour-pattern of the wings distinguish this species from the rest of this species-group. Not well shown in the illustrations given by Warren (1923) is the presence on the ♂ fore wing of lustrous white or pale grey scales along the apical part of the postmedial fascia of the fore wing, at the apex, along the outer margin and in the posterodistal area of the wing. The female is figured in Pl. 3, fig. 101. The under surface of the wings is orange, yellow or buff. The chief diagnostic features in the ♂ genitalia in comparison with the remainder of this species-group are the shape of the valve processes and the presence of a single, large, spinose cornutus on the vesica. The shape of the ventral lip of the ostium and the partly sclerotized, striate corpus bursae may prove to distinguish the ♀ genitalia when both sexes of related species are known. The available evidence does not clearly indicate which of the related species is most closely allied to *pavaca*.

A case could be made for specific separation of the nominate subspecies and *sinensis* but I have chosen the present intraspecific association until geographic

variation in related species has been studied. Recently collected material from Nepal in the Munich Museum may provide suitable evidence.

Distribution. Two subspecies are known: the nominate subspecies (N. INDIA and SIKKIM) and *sinensis* (CHINA). A single ♂ from TONKING [Vietnam] in the Daniel Collection, Munich, probably represents a third subspecies (see *sinensis*).

Oreta pavaca pavaca (Moore)

(Text-figs. 47-50)

Oreta pavava Moore, [1866]: 815.

Psiloreta pavaca (Moore) Warren, 1923: 486. [Fig.]

Psiloreta pavaca (Moore); Gaede, 1931: 48.

Psiloreta pavaca purpurea Warren, 1923: 486. [Fig.] **syn. n.**

Psiloreta pavaca olivacea Warren, 1923: 486. [Fig.] **syn. n.**

The type material of Warren's "ab. *flavida*" (1923: 486, pl. 51) is conspecific with the lectotype of *pavaca*.

Externally, this subspecies can not be separated from *sinensis* with any certainty. The orange under surface of the fore wings of the ♂ is more intensely coloured in this subspecies, not suffused with grey except at the apex. The shape of the saccus, valve processes, uncus, aedeagus and eighth tergite distinguish the ♂ genitalia, and the shape of the ostium the ♀ genitalia.

There is considerable individual variation in the colour of the upper surface of the ♂ wings, the ground-colour of which may vary from a dark purplish brown (as in the lectotype of *purpurea*) to a slightly greenish brown (lectotype of *olivacea*) or a pale reddish brown (ab. *flava*). From the limited and possibly faded material available for study it seems probable that intermediates occur between these three colour-forms. Similar variation in coloration occurs in the ♀, the paler forms of which, unlike the ♂, have dark strongly marked postmedial fasciae. The under surface of the ♂ fore wings is invariably orange, while the hind wings are paler orange or yellow. The under surface of the ♀ fore wing is buff or dull orange, and the hind wing pale buff or yellow.

Wing. ♂ 20.0-24.5 mm. (28); ♀ 23.5-26.0 mm. (6).

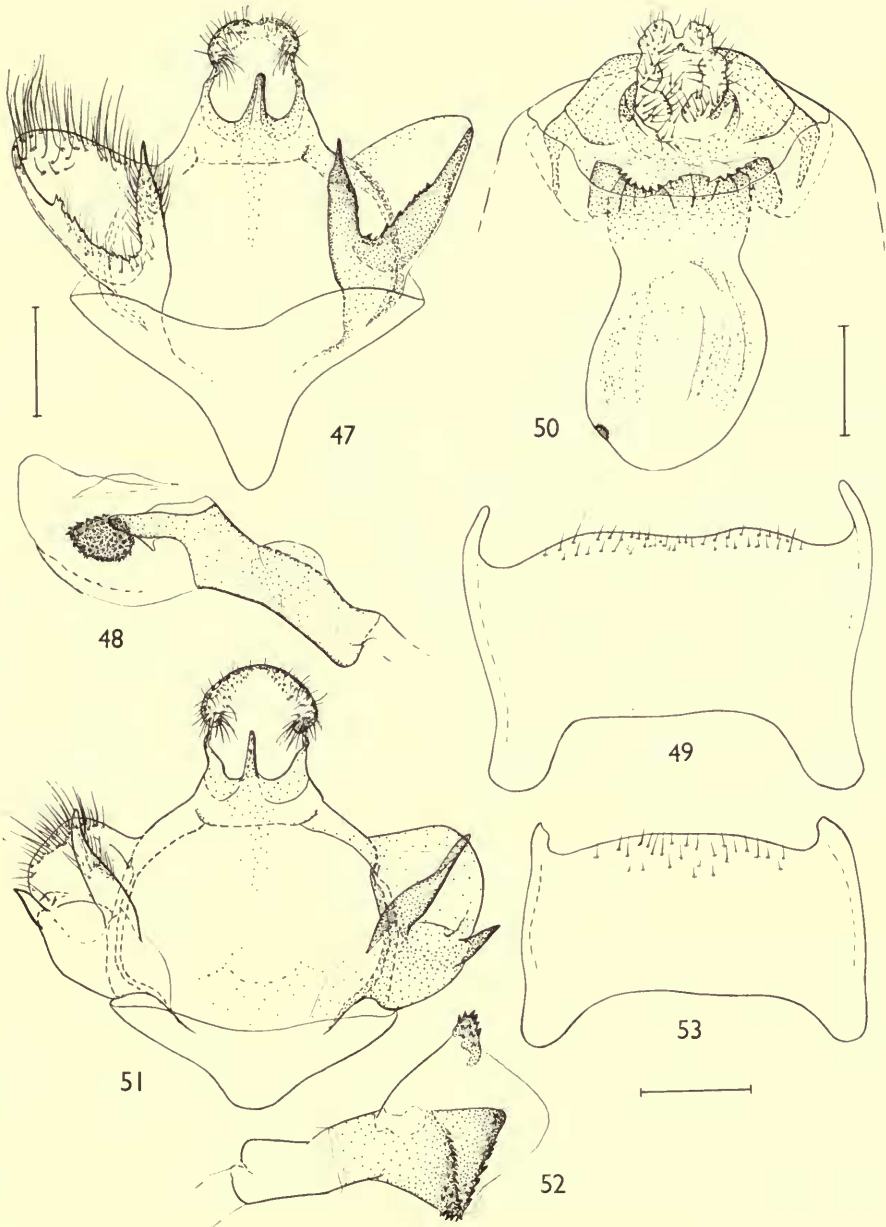
Distribution. N. INDIA and SIKKIM.

Type material.

pavaca. LECTOTYPE ♂, here designated, labelled: Darjeeling; Moore Coll. 94-106; *Oreta pavaca* Moore ♂; Drepanidae genitalia slide No. 1568. In B.M. (N.H.).

olivacea. LECTOTYPE ♂, here designated, labelled: Khasis, Nat. Coll.; Collectio H. J. Elwes; *Ps. pavaca* subsp. *olivacea* Type ♂ Warr.; Rothschild Bequest B.M. 1939-1. In B.M. (N.H.).

purpurea. LECTOTYPE ♂, here designated, labelled; Khasis, June 1896, Nat. Coll.; Rothschild Bequest B.M. 1931-1; *Ps. pavaca* subsp. *purpurea* Type ♂ Warr. In B.M. (N.H.).



FIGS. 47-53. *Oreta* genitalia. 47-50, *pavaca pavaca*. 47, ♂; 48, aedeagus; 49, ♂ eighth abdominal sternite; 50, ♀. 51-53, *pavaca sinensis*. 51, ♂; 52, aedeagus; 53, ♂ eighth abdominal sternite.

Other material. *B.M. (N.H.)*. N.W. INDIA: 1 ♀, Simla, 7,000 ft.; 1 ♂, Masuri, ix-x.1917. N.E. INDIA: 6 ♂, 2 ♀, Darjeeling, vii.1886 (*Möller, Pilcher, Elwes*); 9 ♂, 1 ♀, Khasia Hills, iv-xi.1894. SIKKIM: 8 ♂, 2 ♀, 1888, v-xi.1896, 23.iii-29.iv.1889 (*Möller, Pilcher*). INDIA: 1 ♂ (*Parish*). *Zoologisches Museum, Berlin*. N.E. INDIA: 5 ex., Darjeeling.

***Oreta pavaca sinensis* ssp. n.**

(Pl. 3, fig. 101; Text-figs. 51-54)

Most ♂ specimens of this subspecies can be distinguished by the greyish pink or orange coloration of the under surface of the fore wing. Numerous differences in the genitalia of both sexes separate *sinensis* from the nominate subspecies.

Wing. ♂ 18.5-25.5 mm. (18); ♀ 21.5-26.5 mm. (5).

Distribution. CHINA (Szechwan, Fukien, Chekiang). A ♂ specimen from VIETNAM in the Daniel collection, Munich, differs from the type of *sinensis* in the shape of the saccus, valves, aedeagus and eighth tergite and may prove to represent a new subspecies most closely allied to *sinensis*.

Holotype ♂. Fukien, Kuatun, 2,300 m., 18.v.1946 (*Klappperich*); Drepanidae genitalia slide No. 1567. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn*. CHINA: 7 ♂, 1 ♀, type-locality, 4.v-15.vi.1938, 25.v-14.vi.1946 (*Höne, Klappperich*); 17 ♂, 2 ♀, Chekiang, West Tien-mu-shan, 23.iv-27.x.1932 (*Höne*); 11 ♂, 4 ♀, East Tien-mu-shan, 19.v-3.xi.1931 (*Höne*). *B.M. (N.H.)*. CHINA: 3 ♂, type-locality, 7.v-16.vii.1938, 24.iii.1946 (*Klappperich, Höne*); 4 ♂, 2 ♀, Chekiang, West Tien-mu-shan, 2.v-16.x.1932 (*Höne*); 1 ♂, Szechwan, Siao-lou, 1902; 1 ♂, 2 ♀, Szechwan, Tien-tsuen, 1903; 2 ♂, Szechwan, Tu-pa-keo, 1929 (*Kelley-Roosevelt Expedition*). *Daniel Collection, Munich*. CHINA: 1 ♂, type-locality, 7.vi.1938 (*Klappperich*); 3 ♂, 3 ♀, Chekiang, 25.v-25.x.1932 (*Höne*).

***Oreta eminens* (Bryk) comb. n.**

(Pl. 3, fig. 102; Text-figs. 55-57)

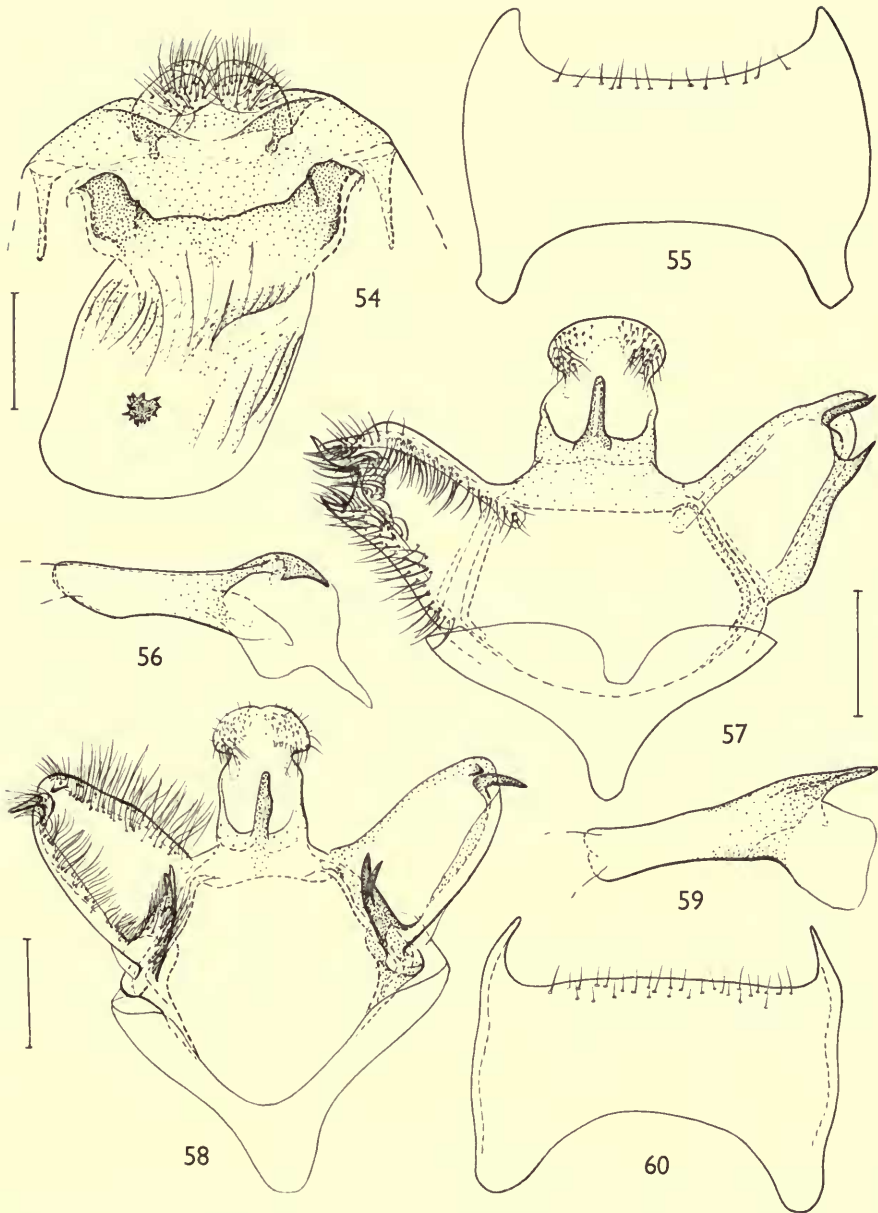
Rhamphoreta eminens Bryk, 1943: 25. [Good fig.]

This distinctive species is easily distinguished in the ♂ from its close relatives *sanguinea* and *liensis*, both of which also occur in China, by the mottled yellow and brown colour-pattern (see Plate in Bryk, 1943), the more elongate fore wing apex and by the presence of a dark patch at the anal angle of the hind wing. The main differences in the ♂ genitalia between *eminens* and the species *sanguinea* and *liensis* are in the shape of the valve processes and the terminal process of the aedeagus (Text-figs. 56, 57).

The ♀ is unknown.

Wing. ♂ 19.0-22.0 mm. (6).

Distribution. N.E. BURMA, CHINA (Kwangsi, Fukien).



FIGS. 54-60. *Oreta* genitalia. 54, *pavaca sinensis* ♀. 55-57, *eminens*. 55, ♂ eighth abdominal sternite; 56, aedeagus; 57, ♂. 58-60, *flavobrunnea*. 58, ♂; 59, aedeagus; 60, eighth abdominal sternite.

Type material.

Holotype ♂ [not ♀ as stated by Bryk]. N.E. Burma, Kambaiti, 7,000 ft., 5.vi.1934 (*Malaise*); Drepanidae genitalia slide No. 902. In the Naturhistoriska Riksmuseet, Stockholm.

Other material. *Museum Koenig, Bonn*. CHINA: 3 ♂, Fukien, Kuatun, 2,300 m., 3.v-1.vi.1938 (*Klapperich*); 1 ♂, Kwangsi, Lingping, viii.1922 (*Höne*). *B.M. (N.H.)*. CHINA: 1 ♂, Fukien, Kuatun, 2,300 m., 21.v.1938 (*Klapperich*); 1 ♂, Kwangsi, Lingping, 12.vii.1922 (*Höne*).

Oreta flavobrunnea sp. n.

(Pl. 3, fig. 103; Text-figs. 58-60)

♂. Antennae closely lamellate, pale buff. Palp and clypeofrons brownish orange, vertex dark buff. Collar pale buff dorsally, brownish orange ventrally and lateral to eyes.

Dorsal surface of thorax greenish buff, but dull yellow anteriorly, followed just before margin by dull pink band; ventral surface pale buff. Outer surface of legs brownish orange, inner surface pale buff.

R_1 arises from near the proximal end of the areole. Wing shape and colour-pattern as in Pl. 3, fig. 103. Ground-colour of upper surface of both wings buff, slightly greenish in tone. Costal area of fore wing speckled with pinkish white and pink scales; apex speckled with white and black; fringe of apex dull pink anteriorly, very dark grey posteriorly; postmedial fascia greenish yellow. Distal and posterodistal margin of cell irregularly marked with white scales (usually, e.g. holotype, present only at middle of discocellular vein and at posterodistal angle of cell in hind wing). Area of hind wing overlapped by fore wing dull pink. Under surface of fore wing greyish pink with pale grey postmedial; hind wing greyish pink proximally, orange distally with narrow yellow orange area along middle of outer margin.

Dorsal surface of abdomen greenish buff, palest posteriorly; ventral surface greyish pink.

♂ genitalia (Text-figs. 58-60): characterized chiefly by the short bispinose process at the base of the valve.

♀. Not known.

Wing. ♂ 20.5-23.0 mm. (21).

The affinities of this species lie with *liensis* sp.n., *sanguinea* Moore and *eminens* Bryk. It is easily distinguished by the greenish buff coloration of the upper surface and by the bispinose process at the base of the valve in the male genitalia.

Distribution. CHINA (Yunnan).

Holotype ♂. China, N. Yunnan, Likiang, 2,000 m., 2.viii.1934 (*Höne*); Drepanidae genitalia slide No. 1572. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn*. CHINA: 14 ♂, type-locality, 2,000 m., 3,000 m., 5-28.vii.1934, 20.vii-6.viii.1935 (*Höne*). *B.M. (N.H.)*. CHINA: 5 ♂, type-locality, 2,000 m., 3,000 m., 5-12.vii.1934, 7,28.vii.1935 (*Höne*) 1 ♂, YUNNAN, 1918 (*Forrest*). *Daniel Collection, Munich*. CHINA: 2 ♂, type-locality, 5.vii.1934, 7.vii.1935 (*Höne*).

Oreta angularis sp. n.

(Pl. 4, figs. 104-106; Pl. 5, fig. 107-108)

♂. Palp dull scarlet. Head dull scarlet, becoming paler towards labrum and buff dorso-posteriorly. Antennae closely lamellate, pale brownish buff. Collar buff above level of eyes, dull scarlet lateral and ventral to eyes.

Dorsal surface of thorax pale brown, palest anteriorly; ventral surface pale orange. Coloration of legs doubtful, but outer surface of at least fore and mid legs dull scarlet.

Wing shape as in Pl. 5, figs. 107-108. Fore wing angled at Cu_{1a} and hind wing at Rs . In the fore wing R_1 arises either from the cell, near its distal end, or from the proximal end of the areole. Upper surface of wings pale yellowish brown, lightly speckled with grey. Discocellular vein of fore wing mostly white, with separate white spot at posterior angle of cell; very weakly marked postmedial fascia present in holotype, parallel to outer margin, most noticeable at costa; anal angle with faint grey patch. Hind wing with well marked white discocellular spot and faint white spot at posterior angle of cell. Under surface of fore wing pale orange-brown, lightly speckled with grey, and with trace of postmedial fascia; hind wing dull orange speckled with grey, otherwise unmarked.

Colour of abdomen as for adjacent surface of hind wing; pale yellowish brown dorsally, dull orange ventrally.

♂ genitalia as in Pl. 4, figs. 104-106. The spinose patch nearly opposite the apical process of the aedeagus is continuous with a single transverse row of spines, each spine pointing to the left. This row of spines is represented by a dark line in Pl. 4, fig. 105.

♀. As for ♂. The only known specimen lacks an abdomen.

Wing. ♂ 20.5-21.0 mm. (3); ♀ 24.5 mm. (1).

It may be necessary to remove *angularis* from this species-group when the structure of the ♀ genitalia is known. At present, however, the only structural discordances in comparison with the remaining species are in the shape of the wings and in the complexity of the valve armature. The wing shape, though striking, may not be of particular phyletic significance: Watson (1965: 95) for example has shown that in two closely related species of an African genus of Oretinae (*Spidia* Butler), there is a significant difference in wing shape although the overall similarity between the two species is close.

Except for the dissimilarity in wing shape, *pavaca* Moore most closely resembles *angularis* externally.

Distribution. CHINA (Fukien).

Holotype ♂. China, Fukien, Kuatun, 1.ix.1938 (*Höne*); Drepanidae genitalia slide No. 1700. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn*. CHINA: 1 ♂, 1 ♀, Fukien, Kuatun, 1.ix.1946 (*Klapperich*), 1.ix.1938 (*Höne*). *B.M. (N.H.)*. CHINA: 1 ♂, Fukien, Kuatun, 2,300 m., 29.viii.1946 (*Klapperich*).

Oreta vatama Moore

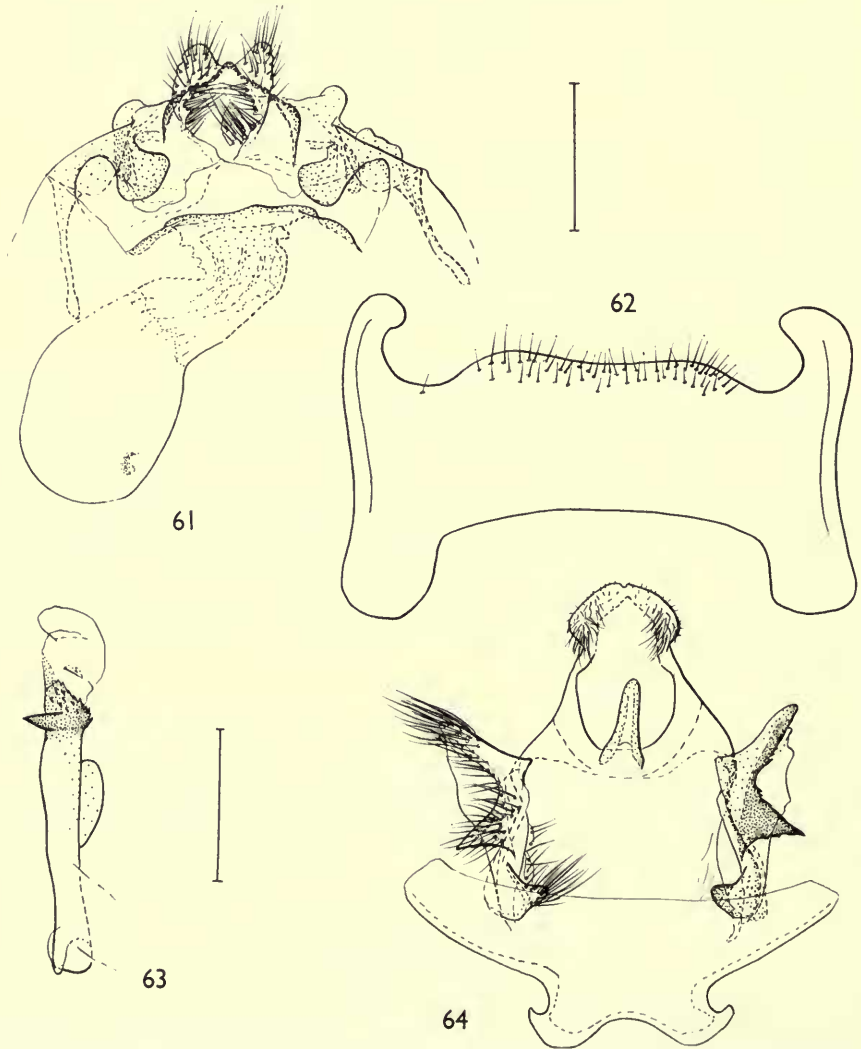
(Pl. 5, fig. 109; Text-figs. 61-72)

This is an easily identified species, which had been confused with *obtusa* Walker prior to the paper by Watson (1961). It shares a sufficient proportion of characters with other members of this species-group to be placed here, though it can be distinguished from all of them by the open-lamellate antennae, the strongly arcuate

postmedial fascia on the fore wing, by the origin of R_1 from the distal end of the cell in the fore wing, and the presence of a bilobed saccus in the ♂ genitalia.

No polymorphism in colour-pattern appears to be present in *vatama*.

Four subspecies are known, three of which are described below as new: the nominate subspecies (N.E. India, Sikkim, Bhutan, N. Burma); *luculenta* (N.W. India, Kashmir); and the Chinese subspecies *acutula* (Yunnan, Szechwan), and *tsina* (Shensi).



FIGS. 61-64. *Oreta vatama vatama* genitalia. 61, ♀; 62, ♂ eighth abdominal sternite; 63, aedeagus; 64, ♂.

***Oreta vatama vatama* Moore**

(Text-figs. 61-64)

Oreta vatama Moore, [1866] : 816.*Oreta vatama* Moore; Watson, 1961 : 343.*Oreta obtusa* Walker *sensu* Strand, 1911 : 204. [Partim] [Fig. of *vatama vatama*.]*Oreta obtusa* Walker *sensu* Bryk, 1943 : 24. [Fig.]

Most males of this subspecies have a less strongly convex outer margin than in the remaining three subspecies. Small differences in the shape of the valves and in the ornamentation of the aedeagus provide, however, the best method of separation of the males (see text-figs.). The ♀ genitalia may also prove to be diagnostic, but the females of two of the four subspecies are at present unknown.

Wing. ♂ 17.0-21.0 mm. (79); ♀ 20.0-24.0 mm. (4).

Type material.

Original type material lost (see Watson, 1961 : 343). NEOTYPE, here designated, labelled: Neotype; Darjeeling, 4-7,000; Moore Coll. 94-106; *Oreta vatama* Moore; Drepanidae genitalia slide No. 1571. In the B.M. (N.H.).

Other material. B.M. (N.H.). N.E. INDIA, SIKKIM, BHUTAN, N. BURMA.

***Oreta vatama luculenta* ssp. n.**

(Pl. 5, fig. 109; Text-figs. 65-67)

Oreta obtusa Walker *sensu* Strand, 1911 : 204. [Partim]

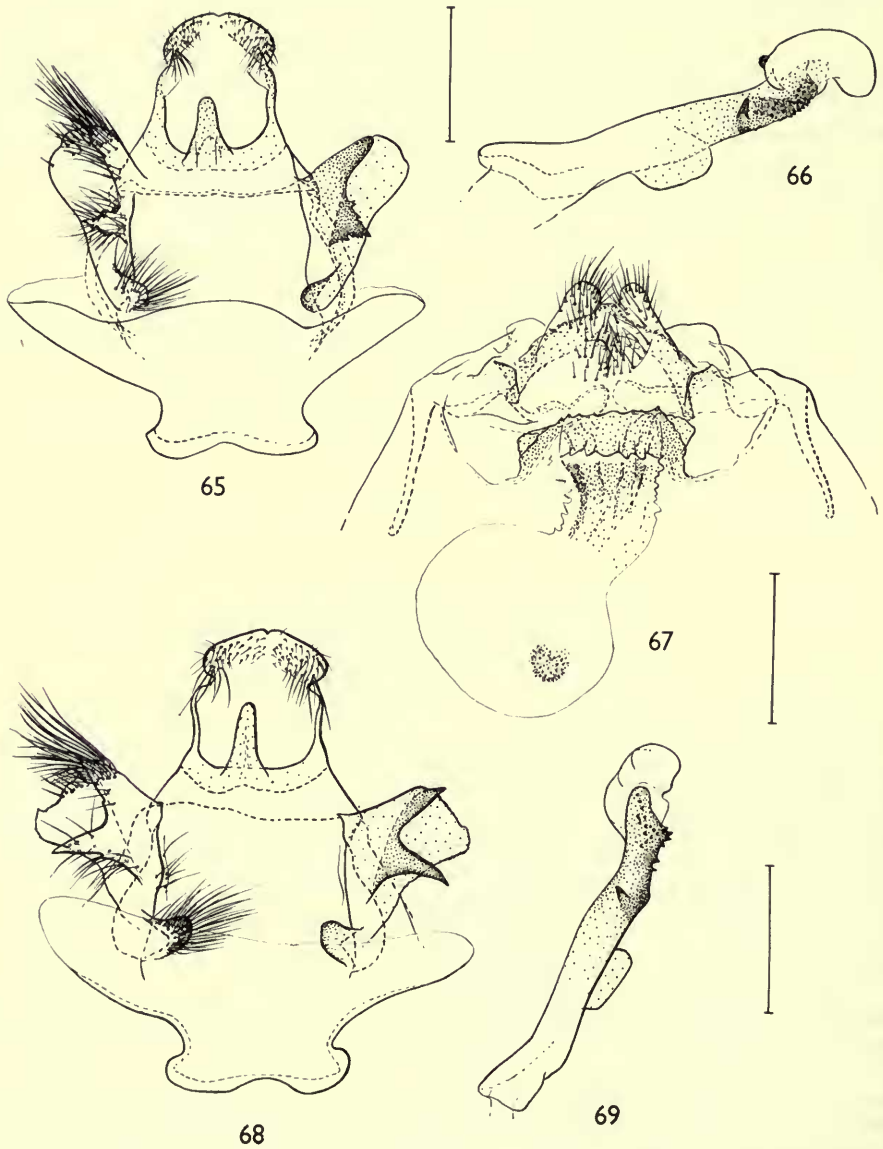
This subspecies is separable from the nominate subspecies, which occurs in N.E. India, by the more strongly convex outer margin and more strongly falcate apex of the ♂ fore wing. It can be distinguished from each of the other three subspecies by the very weakly marked outer marginal band on the fore wing and by the ♂ genitalia. The measurements below show that the measured examples of *luculenta* are larger than in the remaining subspecies: the smallest ♂ examined is as large as the largest ♂ of any of the other subspecies.

Wing. ♂ 21.0-24.0 mm. (22); ♀ 21.0-25.0 mm. (4).

Distribution. N.W. INDIA, KASHMIR and PAKISTAN.

Holotype ♂. Kashmir, Gulmarg, at light, 15.vii.1931 (*Fletcher*); Drepanidae genitalia slide No. 1693. In B.M. (N.H.).

Paratypes. B.M. (N.H.). KASHMIR: 10 ♂, type-locality, 10-26.vii.1931 (*Fletcher*); 2 ♂, Kashmir Valley, vii.1903 (*Ward*); 1 ♀, Liddar Valley, 8,000 ft., 1903 (*Ward*). N.W. INDIA: 3 ♂, Dalhousie, 7.ix.1906 (1 ex.) (*Barrow et al.*); 2 ♂, Simla, 7,000 ft. (*Jones*). PAKISTAN: 5 ♂, 1 ♀, Punjab, Murree Hills, Khyra Gully, 8-12.ix.1881.



FIGS. 65-69. *Oreta* genitalia. 65-67, *watama luculenta*. 65, ♂; 66, aedeagus; 67, ♀. 68-69, *watama acutula*. 68, ♂; 69, aedeagus.

***Oreta vatama acutula* ssp. n.**

(Text-figs. 68-70)

Distinguished by the ornamentation of the aedeagus in the ♂ genitalia. The apical spine at the distal end of the costa of the valve may or may not be present in the ♂ genitalia, and the proximal costal spines are variable in length and shape though apparently never as short as in *tsina*. Probably not separable externally from *tsina*, the other Chinese subspecies, but with a more strongly convex outer margin to the fore wing than in the nominate subspecies.

Wing. ♂ 17.0-21.5 mm. (25); 21.0-23.0 mm. (3).

Distribution. CHINA (Yunnan, Szechwan).

Holotype ♂. N. Yunnan, Likiang, 4,000 m., 21.vii.1935 (*Höne*); Drepanidae genitalia slide No. 1570. In the Museum Koenig, Bonn.

Paratypes. *Museum Koenig, Bonn*. CHINA: 6 ♂, type-locality, 21.vii-31.viii.1935 (*Höne*). *B.M. (N.H.)*. CHINA: 2 ♂, type-locality, 24.vii.1935 (*Höne*); 13 ♂, 3 ♀, Szechwan, Tay-tou-ho, Moupin, Tu-pa-keo (7,400 ft.), Ta-t sien-lou, Tse-kou, Siao-lou, Shin-kai-si (6-7,000 ft.), Beh-lu-din. *Daniel Collection, Munich*. CHINA: 2 ♂, type-locality, 27.vii-2.viii.1935 (*Höne*). *Naturhistoriska Riksmuseet, Stockholm*. CHINA: 1 ♂, [Szechwan], Frontière orientale du Thibet, 1906 (*Déjean*).

***Oreta vatama tsina* ssp. n.**

(Text-figs. 71-72)

The shape and ornamentation of the valve and aedeagus distinguish *tsina*. The coloration and colour pattern are as for *acutula*.

Wing. ♂ 19.0-20.5 mm. (8).

Distribution. CHINA (Shensi).

Holotype ♂. China, S. Shensi, Tapaishan im Tsinling, ca. 1,000 m., 21.vii.1935 (*Höne*); Drepanidae genitalia slide No. 1682. In the Museum Koenig, Bonn.

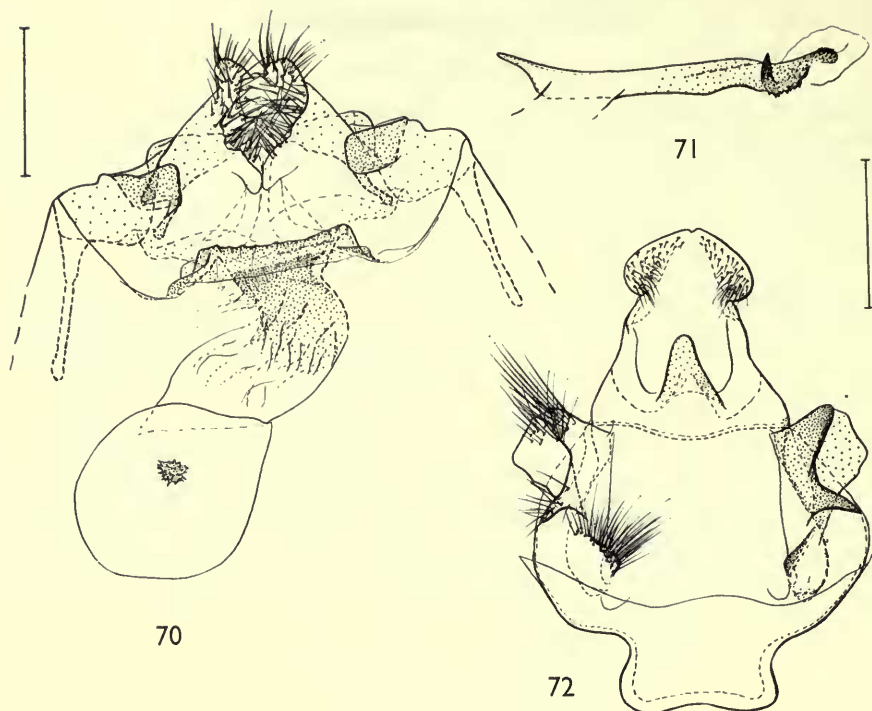
Paratypes. *Museum Koenig, Bonn*. CHINA: 5 ♂, type-locality, 3-23.vii.1935 (*Höne*). *Daniel Collection, Munich*. CHINA: 2 ♂, type-locality, 21.vii.1935 (*Höne*). *B.M. (N.H.)*. CHINA: 1 ♂, type-locality, 21.vii.1935 (*Höne*).

***Oreta obtusa* Walker**

(Text-figs. 73-76)

Oreta obtusa Walker, 1855: 1167.

The genitalia of the nominate subspecies and the subspecies *speciosa* Bryk, *aequitermen* Warren and *javae* Watson have been illustrated by the author (Watson, 1961). The whole moth has been best figured by Bryk (1943) in a half-tone plate of *speciosa*.



FIGS. 70-72. *Oreta* genitalia. 70, *vatama acutula*, ♀. 71-72, *vatama tsina*.
71, aedeagus; 72, ♂.

No other species of *Oreta*, except for *brunnea* Wileman, has a large dark spot between M_1 and M_2 near the outer margin of the hind wing (see Bryk, 1943 or Warren, 1923). In other respects, both externally and in the genitalia, *obtusa* shows affinities with the species of the species-group *rosea*.

Distribution. *O. obtusa obtusa* (N. India); *obtusa speciosa* (N.E. Burma, China); *obtusa aequitermen* (Malaya, Sumatra, Celebes); *obtusa javae* (Java, Bali); *obtusa dejeani* ssp.n. (China); undescribed subspecies (10 ex. in B.M. (N.H.) from S.W. Sumatra, Mt. Korintji, 7,300 ft.).

***Oreta obtusa speciosa* (Bryk) comb. n.**

Psiloreta speciosa Bryk, 1943 : 26. [Fig.]

Psiloreta obtusa speciosa Bryk; Watson, 1961 : 345.

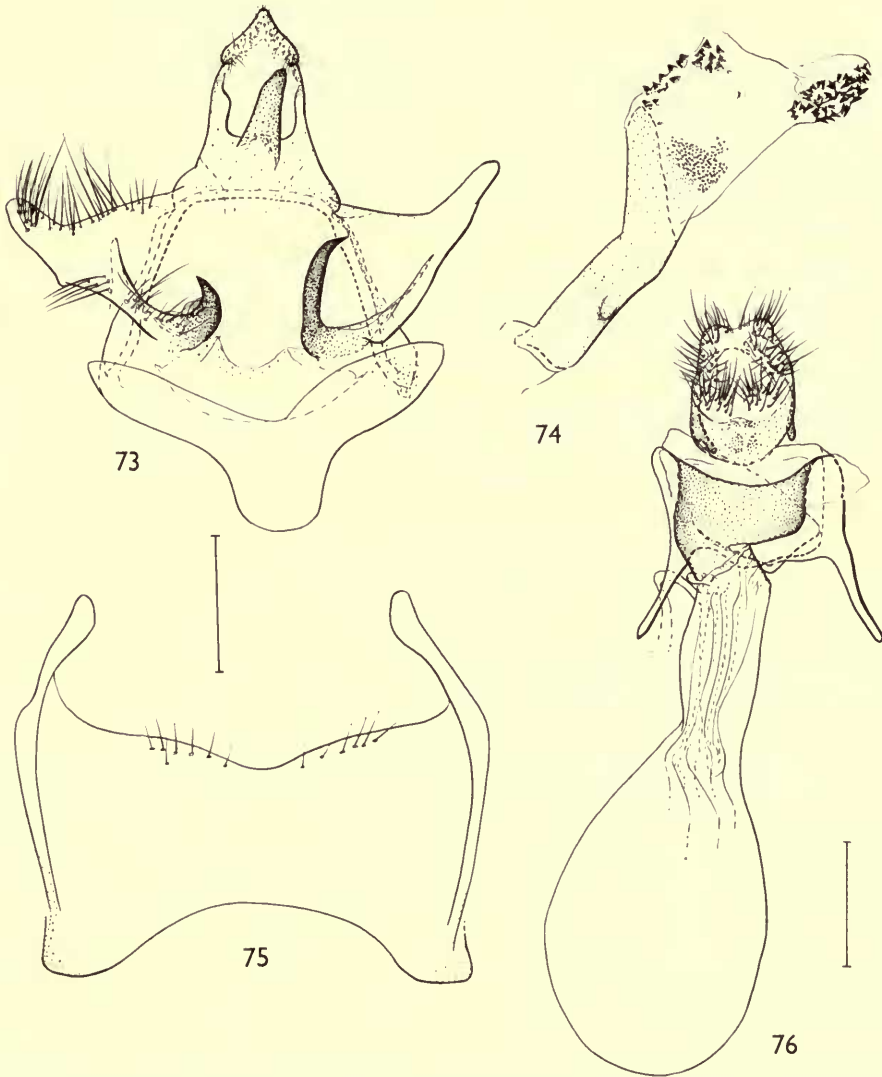
This subspecies can be distinguished from both the nominate subspecies and from the other Chinese subspecies, *dejeani*, by the strongly falcate fore wings and by the ♂ genitalia. The shape of the eighth sternite and ornamentation of the aedeagus suggests closest affinities with *dejeani*.

All the material available for study represented the yellow-and-brown form of the species.

Distribution. N.E. BURMA and CHINA (Fukien, Szechwan). Some of the Szechwan examples originated from localities close to those recorded for *dejeani*. The topography of this region is, however, one of steep-sided valleys which may serve to isolate *speciosa* from *dejeani*. In no particular locality have both supposed subspecies been captured.

Type material.

Holotype ♂, N.E. Burma, Kambaiti, 2,000 m., 12-17.vi.1934; Drepanidae genitalia slide No. 834. In the Naturhistoriska Riksmuseet, Stockholm.



FIGS. 73-76. *Oreta obtusa dejeani* genitalia. 73, ♂; 74, aedeagus; 75, ♂ eighth abdominal sternite; 76, ♀.

Other material. *B.M. (N.H.)*. BURMA: 2 ♂, Hpimaw Fort, near Myitkyina, 8,000 ft., 14-18. viii. 1923 (*Swann*). CHINA: 2 ♂, Fukien, Kuatun, 24.iii-14.iv. 1946 (*Klapperich*); 1 ♂, Szechwan, Moupin, 1897; 1 ♀, Szechwan, Tsien-tsuen, Yuin-kin, 1899; 1 ♂, Szechwan, 30 miles N. of Chengtu, Ben Luh Din. *Museum Koenig, Bonn*. CHINA: 4 ♂, Fukien, Kuatun, 3.iv-1.vi. 1938, 7.v. 1946 (*Klapperich*).

Oreta obtusa dejeani ssp. n.

(Text-figs. 73-76)

Externally this subspecies is probably not separable from the nominate subspecies, but like the latter it can be distinguished from *speciosa* by the less strongly falcate fore wing. The eighth sternite in the ♂ genitalia is similar to that of *speciosa*; the ornamentation of the aedeagus indicates similar affinities, but is diagnostic; the valve processes, however, are most like those of the nominate subspecies. The ♀ genitalia are illustrated in Text-fig. 76.

All the material represented the yellow-and-brown form of the species.

Wing. ♂ 18.5-20.5 mm. (2); ♀ 22.0-23.0 mm. (2).

Distribution. CHINA (Szechwan). The close geographical proximity between this subspecies and *speciosa* is discussed under the latter.

Holotype ♂. China, Szechwan, Siao-lou, 1899; Drepanidae genitalia slide No. 1751. In *B.M. (N.H.)*.

Paratypes: *B.M. (N.H.)*. CHINA: 1 ♂, 2 ♀, type-locality, 1893-1903 (*Déjean et al.*).

Oreta brunnea Wileman comb. rev.

(Text-figs. 77-79)

Oreta brunnea Wileman, 1911: 149.

Psiloreta brunnea (Wileman) Warren, 1923: 486.

Psiloreta brunnea (Wileman); Gaede, 1931: 48.

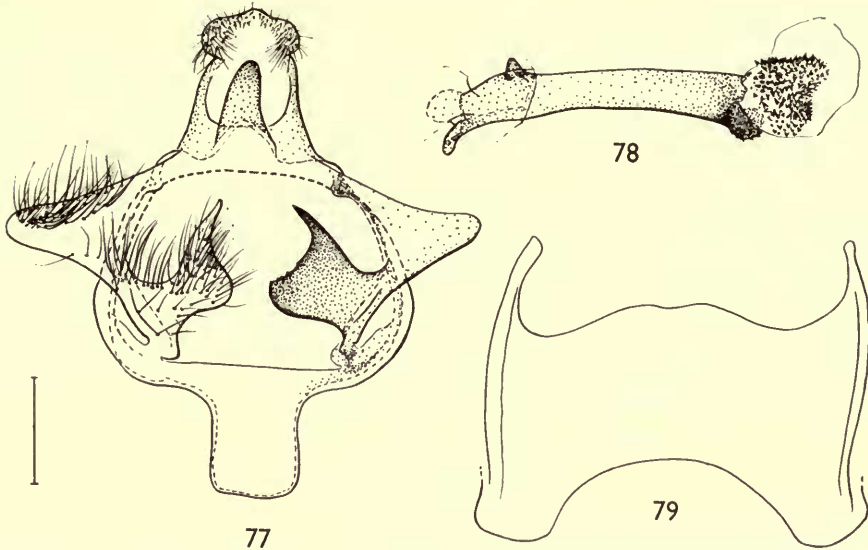
The colour-pattern of this species is probably indistinguishable from that of *obtusa* (q.v.). Of the fifteen examined specimens of this species, twelve represent the brown form of the species, three the yellow-and-brown form. As in *obtusa*, a large dark spot is present near the outer margin on the upper surface of the hind wing between M_1 and M_2 . The ♂ genitalia are illustrated in Text-figs. 77-79. The shape of the sclerotized basal saccular process of the valve and the ornamentation of the aedeagus separate *brunnea* from *obtusa*.

Wing. ♂ 18.0-22.0 mm. (13).

Distribution. FORMOSA.

Type material.

Holotype ♂. Formosa, Arizan, 7,300 ft. [7,500 "ft." on pin label], vii. 1908; Drepanidae genitalia slide No. 1739. In *B.M. (N.H.)*.



FIGS. 77-79. *Oreta brunnea* genitalia. 77, ♂; 78, aedeagus; 79, ♂ eighth abdominal sternite.

Other material. *B.M. (N.H.)*. FORMOSA: 9 ♂, Arizan, 13-21.viii.1908 (*Wileman*); 1 ♂, Arizan, vis à vis Mt. Morrisson, Kagé district, 8,000 ft., vi,vii.1908; 1 ♂, Arizan, Kagi district, vii.1908; 3 ♂, Rantaizan, v.1909 (*Wileman*).

SPECIES-GROUP *INSIGNIS*

Antenna bipectinate or closely lamellate. Outer margin of fore wing convex or straight in ♂, convex in ♀; postmedial fascia of upper surface oblique, strongly marked. Outer margin of hind wing convex. Saccus in ♂ genitalia digitate or entire; valve with or without membranous lobe, with one or more simple or branched processes; diaphragma with paired medial sclerites, the posterior ends of which may be free; gnathos with single posteriorly directed medial process; aedeagus with or without lateral or terminal process, cornutus present or absent. Ductus bursae of ♀ genitalia with invagination or fold anteriorly; completely sclerotized, partly sclerotized, or sclerotized only at invagination. Corpus bursae with or without signum.

The species of this group are very similar to each other in coloration and colour-pattern, except for *singapura* which can be satisfactorily identified without examination of the genitalia, as can *perobliquilinea* where solely Malayan material is concerned.

Eight species are now recognized, but at least two further species have yet to be named. Four of the species of this group are restricted to the Papuan Subregion (*perfida*, *sublustris*, *subvinosa*, *unilinea*); *singapura* (see introduction to *Oreta*) extends for over 3,000 miles from Malaya to New Guinea; *bicolor* and *perobliquilinea* are restricted to the Malayan Subregion; *insignis* occurs in Oriental China, Formosa and Japan and is the only species whose range extends into the Palaearctic Region.

Two undescribed species are represented by short series from Celebes and New Guinea respectively in the B.M. (N.H.).

Following the account of the sole Chinese species, *insignis*, is an alphabetic list of all the species now classified in the species-group *insignis*. Original and other important references are given, followed by type-specimen information, including designation of lectotypes where necessary. Some new synonymy is included in this list. A detailed account of the taxonomy and distribution of this species will be published in a forthcoming paper on some Papuan Drepanidae. In the present paper the stated distribution is that of the holotype or lectotype and of those specimens which have so far been compared with the type. Further study of the material in the B.M. (N.H.) and new material on loan from the Natural History Museum, Leiden, and the Bishop P. Bernice Museum, Honolulu, will undoubtedly produce new information concerning distribution within the group.

***Oreta insignis* (Butler) comb. n.**

(Pl. 6, figs. 110-112)

Hypsomadius insignis Butler; 1877 : 479.

Hypsomadius insignis Butler; Strand, 1911 : 205. [Good fig.]

Hypsomadius insignis Butler; Gaede, 1931 : 42.

Hypsomadius insignis Butler; Inoue, 1959 : 175. [Good fig.]

Hypsomadius insignis Butler; Inoue, 1962 : 41. [Good figs. of antennae, venation, genitalia.]

Hypsomadius insignis v. (?ab.) *formosana* Strand, 1916 : 163 [type locality Formosa]. Synonymized with *insignis* by Inoue, 1962, *ibidem*.

Inoue (1959, 1962) has fully described and figured this species.

No specimen has been seen with the yellow coloration of the hind wing found in the yellow-and-brown form of other species of *Oreta*. There is some individual variation in the ground-colour of the wing, which may be pinkish, purplish or yellowish grey.

Wing (Chinese specimens) : ♂ 17.5-24.0 mm. (19).

Its affinities within the species-group are uncertain, though it is closest to *perobliquilinea* Warren or *bicolor* Warren externally.

Distribution. Inoue (1962) listed JAPAN (Honshu), RYUKYU ISLANDS and FORMOSA. CHINA (Fukien, Szechwan and Kwangsi) has not been recorded previously for this species.

Type material.

insignis. LECTOTYPE ♂, here designated, labelled 77.9 [B.M. (N.H.) registration 1877.9 of material from Japan, Yokohama] Japan; *Hypsomadius insignis* Butler Type; Drepanidae genitalia slide No. 1681. In B.M. (N.H.).

formosana. Holotype. Formosa, Shisa, v-vi. 1912 (*Sauter*); Drepanidae genitalia slide No. 896. In the Deutsches Entomologisches Institut, Berlin.

Other material. B.M. (N.H.). JAPAN : 7 ♂, 4 ♀. CHINA : 1 ♂, Szechwan, Kwanhsien, Omei, 31.vii.1929; 1 ♂, Fukien, Kuatun, 2,300 m., 30.iv.1938 (*Klapperich*); 1 ♂, Kwangsi, Lingping, 29.vi.1922 (*Höne*). *Museum Koenig, Bonn*.

JAPAN : 4 ♂, 1 ♀. CHINA : 6 ♂, Fukien, Kuatun, 2,300 m., 3.v-13.viii.1938 (*Höne, Klapperich*); 1 ♂, Fukien, Amoy, 3.v.1924 (*Höne*); 7 ♂, Kwangsi, Lingping, iii, v.1922, 23.v-23.viii.1924 (*Höne*); 1 ♂, S. China, Lofanshan, 26.xii.1920 (*Höne*). *Daniel Collection, Munich*. CHINA : 1 ♂, Fukien, Kuatun, 2,300 m., 1.vi.1938 (*Klapperich*). FORMOSA : Wushai, vii.1958. *Zoologisches Museum, Berlin*. CHINA : 8 ♂ (*Mell*).

Oreta bicolor Warren comb. rev.

Oreta bicolor Warren, 1897 : 16. Holotype ♂ [not ♀ as stated by Warren]. Malaya, Gunong Ijau. In B.M. (N.H.).

Psiloreta bicolor (Warren) Warren, 1923 : 486.

Psiloreta bicolor (Warren); Gaede, 1931 : 48.

Distribution. MALAYA. Also possibly SUMATRA, JAVA and BORNEO.

Oreta perfida Warren

Oreta perfida Warren; 1923 : 481. Holotype ♂. New Guinea, West Irian, Snow Mts., nr. Oetakwa R. [not Setekwa as stated by Warren], up to 3,500 ft., x-xii.1910 (*Meek*). In B.M. (N.H.).

Oreta perfida Warren; Gaede, 1931 : 45.

Distribution. NEW GUINEA, West Irian.

Oreta perobliquilinea Warren

Oreta perobliquilinea Warren, 1923 : 480. Holotype ♀. Singapore (*Ridley*). In B.M. (N.H.).

Oreta perobliquilinea Warren; Gaede, 1931 : 45.

Distribution. MALAYA and SINGAPORE.

Oreta singapura Swinhoe

Oreta singapura Swinhoe, 1892 : 243. Holotype ♂ [not ♀ as stated by Swinhoe]. Singapore. In the Hope Department Museum, Oxford.

Oreta singapura Swinhoe; Watson, 1961 : 329.

Distribution. Malayan and Papuan Subregions and Celebes. Three subspecies are recognized.

Oreta singapura singapura Swinhoe

Oreta singapura Swinhoe; Warren, 1923 : 480.

Oreta singapura Swinhoe; Gaede, 1931 : 46.

Oreta singapura Swinhoe; Watson, 1961 : 330.

Distribution. SINGAPORE, MALAYA, SUMATRA and BORNEO.

Oreta singapura kalisi Watson

Oreta singapura kalisi Watson, 1961 : 331. Holotype ♂. W. Celebes, Paloe, Loda, 4,000 ft., v. 1937 (*Kalis*). In the B.M. (N.H.).

Distribution. CELEBES.

Oreta singapura continua (Warren)

Cobanilla continua Warren, 1899a : 313. Holotype ♂. New Guinea, Papua, Milne Bay, xii. 1898 (*Meek*). In B.M. (N.H.).

Oreta continua (Warren) Warren, 1923 : 313.

Oreta continua (Warren); Gaede, 1931 : 43.

Oreta singapura continua (Warren); Watson, 1961 : 330.

Oreta dissimilis Warren, 1923 : 482. [Synonymized by Watson, 1961.]

LECTOTYPE ♂, here designated, labelled: D.N. Guinea, Snow Mts., Upper Setekwa, 2-3,000 ft., viii. 1910 (*Meek*); *Oreta dissimilis* Type ♂ Warr. In B.M. (N.H.).

Oreta aurata Warren, 1923 : 483. [Synonymized by Watson, 1961.]

LECTOTYPE ♀, here designated, labelled: Dutch N.G., Snow Mts., nr. Oetakwa R., up to 3,500 ft., x-xii. 1910 (*Meek*); *Oreta aurata* Type ♀ Warr. In B.M. (N.H.).

Oreta ustimacula Warren, 1923 : 483. [Synonymized by Watson, 1961.]

LECTOTYPE ♀, here designated, labelled: Dutch N.G., Snow Mts., nr. Oetakwa R., up to 3,500 ft., x-xii. 1910 (*Meek*); *Oreta ustimacula* Type ♀ Warr. In B.M. (N.H.).

Holoreta leucospila Joicey and Talbot, 1917 : 82. [Synonymized by Watson, 1961.] Holotype ♂. New Guinea, West Irian, Wandammen Mts., 3-4,000 ft., xi. 1914 (*Pratt*). In B.M. (N.H.).

Distribution. NEW GUINEA (West Irian and Papua).

Oreta sublustris Warren

Oreta sublustris Warren, 1923 : 482. Holotype ♂. West Irian, Snow Mts., nr. Oetakwa R., up to 3,500 ft., x-xii. 1910 (*Meek*). In B.M. (N.H.).

Oreta sublustris Warren; Gaede, 1931 : 46.

Distribution. NEW GUINEA (West Irian).

Oreta subvinosa Warren

Oreta subvinosa Warren, 1903 : 255. Holotype ♂. New Guinea, West Irian, Etna Bay, 5.vii. 1896 (*Kühn*). In B.M. (N.H.).

Oreta subvinosa Warren; Gaede, 1931 : 47.

Oreta amblyptila Warren, 1923 : 481. **syn. n.**

LECTOTYPE ♀ [the syntype referred to as ♂ by Warren], here designated, labelled: Dutch N.G., Snow Mts., Upper Setekwa R., 2-3,000 ft., ix. 1910 (*Meek*); *Oreta amblyptila* Type ♂ Warr. In B.M. (N.H.).

Distribution. NEW GUINEA (West Irian).

Oreta unilinea (Warren)

Cobanilla unilinea Warren, 1899 : 2. Holotype ♀. [New Guinea, West Irian], Ron Is., vii. 1897 (Doherty). In B.M. (N.H.).

Oreta unilinea (Warren) Warren, 1923 : 479.

Oreta unilinea (Warren); Gaede, 1931 : 47.

Holoreta cervina Warren, 1907 : 97. **syn. n.**

LECTOTYPE ♂, here designated, labelled: B.N.G. [New Guinea, Papua], Mambare R., Biagi, 5,000 ft., iii. 1906 (Meek); *Holoreta cervina* Type ♂ Warr. In B.M. (N.H.).

Oreta mollita Warren, 1923 : 481. **syn. n.**

LECTOTYPE ♂, here designated, labelled: B.N.G. [New Guinea, Papua], Mambare R., Biagi, 5,000 ft., iii. 1906 (Meek); *Holoreta mollita* Type ♂ Warr. In B.M. (N.H.).

Oreta mollita castaneata Warren, 1923 : 481. **syn. n.**

LECTOTYPE ♂, here designated, labelled: central Dutch N. Guinea, Mt. Goliath, about 139° long., 5-7,000 ft., i. 1911 (Meek); *H. mollita* subsp. *castaneata* Type ♂ Warr. In B.M. (N.H.).

Distribution. NEW GUINEA (West Irian and Papua).

SPECIES-GROUP *EXTENSA*

(Pl. 7, figs. 113-115; Pl. 9, fig. 119)

Antenna open-lamellate. Outer margin of fore wing convex or straight in ♂, convex in ♀; postmedial fascia of upper surface oblique. Outer margin of hind wing convex. Saccus in ♂ genitalia entire; valve with membranous part reduced, but with two heavily sclerotized processes; diaphragma without medial sclerites; gnathos with one or two short medial processes or with medial part absent; aedeagus with single lateral bulge and one or more apical processes, vesica unornamented. Ductus bursae in ♀ genitalia short, sclerotized only near ostium; corpus bursae with single rounded signum; ostium with or without operculum; eighth and ninth segments well sclerotized.

The presence of open-lamellate antennae and a closely similar colour-pattern both in this group and the species-group *fuscopurpurea* suggest that a relatively close relationship exists between them.

Four species are known, each of which is confined to the Oriental Region: *extensa* (N.E. India and China to Celebes); *suffusa* (S. India and Ceylon); an undescribed species, represented in B.M. (N.H.) (New Guinea and Celebes); and *roepkei* (Java). The undescribed species from New Guinea and Celebes appears to constitute what until comparatively recently must have been a superspecies both with *suffusa* and with *extensa* which extends as far east as Celebes where both *extensa* and the new species now occur, the latter entirely replacing *extensa* in New Guinea. The possible Pleistocene origin of *roepkei* is mentioned earlier in the discussion of the genus *Oreta*. *Oreta adona* Strecker, which apparently was erroneously described from the Nearctic Region (Florida), is discussed below.

Oreta extensa Walker

(Pl. 7, figs. 113-115; Pl. 9, fig. 119)

Oreta extensa Walker, 1855 : 1166.*Oreta extensa* Walker; Gaede, 1931 : 44. [Partim.]*Oreta extensa* Walker; Watson, 1961 : 339. [Figs. of genitalia.]*Oreta figlina* Swinhoe, 1905 : 142. [Synonymized by Watson, 1961.]

This species has been compared (Watson, 1961) with the allied *roepkei* Watson which is sympatric with it in eastern Java. Its closest ally is probably *suffusa* Walker (type-locality Ceylon) which, unlike *extensa*, has a moderately convex outer margin to the fore wing in the ♂, and distinctively shaped, inwardly-directed valve processes. A further apparently close ally is *adona* Strecker (stated type-locality : U.S.A., Florida), the ♀ holotype of which has been compared with Oriental material of *extensa* and found to be closely similar though not identical. Information kindly supplied (in correspondence) by Dr. F. M. Brown on the Doll collection, from which Strecker described *adona*, indicates the possibility first indicated by Dyar (1928 : 632) that the holotype of *adona* could have been wrongly labelled and could have been captured in the Philippines or China. The ♀ genitalia of the Chinese examples of *extensa* are not identical with those of the holotype of *adona*, but there remains the possibility that the *adona* type is in fact a female *extensa* from the Philippines.

Both brown and yellow-and-brown forms of the species are known.

Distribution. N.E. INDIA, SIKKIM, SUMATRA, JAVA and CHINA (1 ♀ Yunnan, 1 ♀ Hainan, 1 ♂ Kwangtung) (♀ in B.M. (N.H.), ♂ in Museum Koenig, Bonn). The Chinese material is with little doubt conspecific with the holotype of *extensa*, but may prove to represent a new subspecies when more males of the former become available for study. Material from Formosa which probably also represents *extensa* has yet to be thoroughly studied; a short series from Celebes, also in the B.M. (N.H.), represents a new subspecies.

Holotype ♂. Java [restricted type-locality (Watson, 1961)]; Drepanidae genitalia slide No. 807. In B.M. (N.H.).

Oreta roepkei Watson

Oreta roepkei Watson, 1961 : 339. [Figs.] Holotype ♂. [E. Java], Tengger, Singalangoe, 5,000 ft., v. 1934 (*Kalis*); Drepanidae genitalia slide No. 813. In B.M. (N.H.).

Distribution. Only known from E. JAVA.

Oreta suffusa Walker comb. rev.

Oreta suffusa Walker, 1855 : 1167. Holotype ♀, [not ♂ as stated by Walker]. Ceylon. In B.M. (N.H.).

Oreta suffusa Walker; Warren, 1923 : 484.

Oreta suffusa Walker; Gaede, 1931 : 47.

Oreta violacea Hampson, 1891 : 9. [Poor fig.] **syn. n.**

LECTOTYPE ♂, here designated, labelled: [S. India] Nilgiris, Hampson Coll. 89-129; *Oreta violacea* Hampson, type ♂; 429 A; Drepanidae genitalia slide No. 909. In B.M. (N.H.).
Psiloreta violacea (Hampson) Warren, 1923 : 486. [Poor fig.]
Psiloreta violacea (Hampson); Gaede, 1931 : 49.

Distribution. CEYLON and S. INDIA.

SPECIES-GROUP *FUSCOPURPUREA*

(Pl. 8, figs. 116-118 ; Pl. 9, fig. 120)

The chief diagnostic feature of this monotypic group is the large, heavily sclerotized anellus in the ♂ genitalia, which distinguishes *fuscopurpurea* from *extensa*, its nearest ally.

This group is known from both the Oriental and Palaearctic Regions (China and Japan).

Oreta fuscopurpurea Inoue

(Pl. 8, figs. 116-118 ; Pl. 9, fig. 120)

Oreta extensa ab. *fuscopurpurea* Matsumura, 1927 : 45.

Oreta extensa fuscopurpurea Inoue, 1956 : 370. [Elevation to subspecific rank of *fuscopurpurea* Matsumura.]

Oreta purpurea Inoue, 1961 : 10. [Unnecessary replacement name (as " sp. n.") for *fuscopurpurea* Inoue.] [Full description, map, and figs. of whole insect and ♂ genitalia.]

Oreta purpurea Inoue, 1962 : 37. [Colour-plate of ♂ and ♀ upper surface and figs. of ♂ and ♀ genitalia.]

This species has been recently critically reviewed by Dr. H. Inoue (1961, 1962) who pointed out the similarity in colour-pattern between *fuscopurpurea* and *extensa* Walker which had hitherto been confused in the literature. There are in fact sufficient similarities between these two species externally (antennal structure, venation, colour-pattern) and in the ♂ and ♀ genitalia to prompt the suggestion that the affinities of *fuscopurpurea* lie closest to *extensa*. However, the shape of the valve and gnathus, and the presence of a heavily sclerotized anellus in *fuscopurpurea* prevent its placement in the same species-group as *extensa* and its allies *roepkei* Watson and *suffusa* Walker.

Distribution. Inoue (1961) lists SOUTHERN JAPAN (Shikoku and Kyushu), the RYUKYU ARCHIPELAGO (Okinawa) and FORMOSA. There are two ♂ from CHINA (Hunan and Fukien) in the Museum Koenig, Bonn and a single ♀ from CHINA (Chekiang) in the Daniel collection, Munich.

SPECIES-GROUP *CARNEA*

Antennae bipectinate. Outer margin of fore wing convex or straight in ♂, convex in ♀; postmedial fascia of upper surface oblique, strongly or weakly marked. Outer margin of hind wing convex. Saccus in ♂ genitalia entire; valve with or without membranous lobe, with one or more sclerotized processes; diaphragma with pair of anteriorly-directed anterolateral extensions of gnathos; gnathos with bilobed medial process or without medial process; vesica of aedeagus scobinate or non-scobinate, with or without cornutus; in ♀, ductus bursae short, not

invaginate, corpus bursae without signum; ostial segment variously developed; ninth segment strongly sclerotized.

Two sub-groups can be identified: *jaspidea* and *rubrifumata* forming one complex; *carnea*, *griseotincta* and *indentata* forming a second. Although the ♂ genitalia are highly diagnostic for each complex, the basic plan is, in fact, similar in both. There is a close concordance in external characters between all the species of this group.

The species *jaspidea* and *rubrifumata* are confined to the Papuan Subregion. *O. jaspidea* is unique in *Oreta* in that it is apparently the only species to have crossed the Torres Straits into northern Australia. *O. carnea* is confined to the Malayan Subregion, *indentata* to Celebes, while *griseotincta* is common to the Malayan and Indo-Chinese Subregions. No species is yet known to occur in China, although it is unlikely that *griseotincta* which occurs both in N.E. India and Formosa does not also occur in China.

The following list of species includes original references, type-specimen information, synonymy and preliminary remarks on distribution based on type material or material compared with types.

Oreta carnea (Butler)

Agnidra carnea Butler, 1892: 125.

LECTOTYPE ♂, here designated, labelled: Sandakan 91: 115; *Agnidra carnea* Butler type. In B.M. (N.H.).

Oreta carnea (Butler) Warren, 1923: 484.

Oreta carnea (Butler); Gaede, 1931: 43.

Oreta carnea (Butler); Watson, 1961: 335. [Figs. of genitalia.]

Drepana berenica Swinhoe, 1893: 258.

LECTOTYPE ♂ [syntypes are ♂, not ♀ as stated by Swinhoe], here designated, labelled: Singapore 94: 65; *Drepana berenica* Swinhoe, ♂ type; G.A.B. 1939, 20; Drepanidae genitalia slide No. 544. In B.M. (N.H.). [Synonymized by Watson, 1961: 335.]

Cobanilla hepaticata Warren, 1897: 13. Holotype ♂. Sandakan, 21.iv.1894; Drepanidae genitalia slide No. 542. In B.M. (N.H.). [Synonymized by Watson, 1961: 335.]

Cobanilla cardinalis Warren, 1897: 13. Holotype ♂. N. Borneo, Penungah, 19.xii.1893; Drepanidae genitalia slide No. 543. In B.M. (N.H.). [Synonymized by Watson, 1961: 336.]

This species has recently been discussed by Watson (1961: 335). It is closely allied to *griseotincta* Hampson. Its distribution includes MALAYA, SINGAPORE, SUMATRA, JAVA and BORNEO.

Oreta griseotincta Hampson

Oreta griseotincta Hampson, [1893]: 350.

LECTOTYPE ♂, here designated, labelled: Sikkim, Möller, 1888; *Oreta griseotincta* Hmpsn. type ♂; *Oreta griseotincta* ♂ Hmps.; Collection H. J. Elwes; G.A.B. 1939, 17; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 540. In B.M. (N.H.).

Oreta griseotincta Hampson; Watson, 1961: 332. [Figs. of genitalia.]

This species has recently been reviewed by Watson (1961: 332-333). It is closely related to *carnea* Butler. Two subspecies are known: the nominate subspecies from FORMOSA, N.E. INDIA and SIKKIM, and *acutior* from MALAYA and SINGAPORE.

Oreta griseotincta griseotincta Hampson

Oreta griseotincta Hampson [1893] : 350.

Oreta griseotincta Hampson; Warren, 1923 : 484. [Good fig., ♂.]

Oreta griseotincta Hampson; Gaede, 1931 : 44.

Oreta olivacea Dudgeon, 1899 : 657.

LECTOTYPE ♂, here designated, labelled Sikkim, 1,800 ft., Nov. 1897, *Dudgeon*; 98.13;

Oreta olivacea Dudgeon Type ♂; G.A.B. 1939, 21; Drepanidae genitalia slide No. 539. In B.M. (N.H.). [Synonymized by Watson, 1961 : 333.]

Oreta carnea nucicolor Warren, 1923 : 484. [Good fig., ♀.]

LECTOTYPE ♀, here designated, labelled: Khasis, Nat. Coll; *Oreta nucicolor* Type ♀ Warren; Rothschild Bequest B.M. 1939-1. In B.M. (N.H.). [Synonymized by Watson, 1961 : 333.]

Oreta horishana Matsumura, 1927 : 46. Holotype ♂. Horisha (Takamuku). In the Hokkaido University, Japan. [Synonymy revealed by Dr. H. Inoue, 1965 *in litt.*] **syn. n.**

Oreta griseotincta acutior Watson

Oreta griseotincta acutior Watson, 1961 : 333.

Oreta identata Watson

Oreta identata Watson, 1961 : 336. [Figs. of genitalia.]

Closely related to *griseotincta* Hampson with which it forms a superspecies. Known only from CELEBES.

Oreta jaspidea (Warren)

Cobanilla jaspidea Warren, 1896a : 335. Holotype ♀. Cedar Bay, south of Cooktown (Meek). In B.M. (N.H.).

Holoreta jaspidea (Warren) Warren, 1902 : 340.

Oreta jaspidea (Warren) Rothschild, 1915 : 109.

Oreta jaspidea (Warren); Warren, 1923 : 480. [Good figs.]

Oreta jaspidea (Warren); Gaede; 1931 : 44.

Cobanilla fulvata Warren, 1898 : 423. **syn. n.** Holotype ♀. Key Is., ii. 1896 (*Kühn*); Drepanidae genitalia slide No. 1746. In B.M. (N.H.).

Oreta fulvata (Warren); Gaede, 1931 : 44.

Cobanilla erminea Warren, 1899 : 1.

LECTOTYPE ♂, here designated, labelled: St. Aignan, Nov. 1897 (*Meek*); *Cobanilla erminea* Type ♂ Warr.; *Oreta jaspidea* ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1874. In the B.M. (N.H.). [Synonymized by Gaede, 1931 : 45.]

Oreta hypocalla Lower, 1905 : 179. Holotype ♂. Queensland, Mackay, November. In the S. Australian Museum, Adelaide. [Synonymized by Gaede, 1931 : 45.]

Oreta jaspidea hepatica Warren, 1923 : 480. **syn.n.**

LECTOTYPE ♂, here designated, labelled: Ninay Valley, Central Arfak Mts., Dutch New Guinea, 3,500 ft., Nov. '08 to Jan. '09; *H. jaspidea* subsp. *hepaticata* (sic) Type ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1877. In the B.M. (N.H.).

Two subspecies are known: *rubicunda* Warren from the SOLOMONS, and the nominate subspecies which occurs in BURU, KEY ISLANDS, NEW GUINEA, BISMARCK and LOUISIADE ARCHIPELAGOS and QUEENSLAND (Australia). An examination of the ♂ genitalia of three specimens from the Bismarck Archipelago suggests that a

minor taxonomic gap may exist between the populations of these islands and those of the main island of New Guinea. The extent of the divergence of this Bismarck Archipelago element needs further study.

***Oreta jaspidea jaspidea* (Warren)**

Cobanilla jaspidea Warren, 1896a : 335.

***Oreta jaspidea rubicunda* (Warren)**

Holoreta rubicunda Warren, 1902 : 341.

LECTOTYPE ♂, here designated, labelled: Guadalcanal, iv.01 (*A. S. Meek*); *Holoreta rubicunda* Warr.; Rothschild Bequest B.M. 1931-1; Drepanidae genitalia slide No. 1875. In B.M. (N.H.).

Oreta jaspidea rubicunda Warren; Warren, 1923 : 480. [Good fig.]

Oreta jaspidea var. *rubicunda* Warren; Gaede, 1931 : 45.

There are single specimens in the B.M. (N.H.) from Bougainville, Tugela and Kulambangra Islands as well as from the type locality.

***Oreta rubrifumata* Warren**

Oreta rubrifumata Warren, 1923 : 480. [Good fig.] Holotype ♂. Solomon Is., Tulagi Is. (*Woodford*); Drepanidae genitalia slide No. 1745. In B.M. (N.H.).

Oreta rubrifumata Warren; Gaede, 1931 : 46.

Distribution : Tulagi and Bougainville Islands (SOLOMON IS.).

SPECIES-GROUP *RUBROMARGINATA*

Antenna bipectinate. Outer margin of fore wing convex or angulate; postmedial fascia of upper surface nearly parallel to outer margin, not straight. Outer margin of hind wing convex. Saccus in ♂ genitalia weakly digitate; valve large, partly membranous, with two processes, one basal; diaphragma without medial sclerites; gnathos with single, posteriorly directed process; aedeagus with or without lateral process, apex with one or more processes, vesica with single large cornutus. Ductus bursae in ♀ genitalia sclerotized at ostial end only; corpus bursae without signum; eighth and ninth segments well sclerotized.

The affinities of the group *rubromarginata* probably lie with the species-group *carnea*, especially with the species *jaspidea* and *rubrifumata*. There are similarities both in the coloration and the genitalia of both sexes.

Five species are now placed in this group : *subrosea* and *fulgens* which are known only from males, and *rubromarginata*, *thaumalea* and *triumbrata* known only from females. It is probable that, when further material is available, *thaumalea* will prove to be conspecific with *triumbrata* but to represent a separate subspecies. It is possible that the ♂ type of *fulgens* and the ♀ type of *triumbrata* are also conspecific, but further collecting is needed to confirm or refute this suggestion. Dissimilarities in the colour-pattern suggest that there is little doubt that the types of *subrosea* and *rubromarginata* are not conspecific in spite of sympatry in Borneo and similarity in the wing-shape.

The distribution of this group is entirely Oriental. Three species (*subrosea*, *rubromarginata*, *triumbrata*) are confined to the Malayan Subregion, *fulgens* is Malayan with possible incursions into Celebes and Philippine Subregion, while *thaumalea* is known only from the Philippines. In B.M. (N.H.) there are five ♂ specimens from Celebes, two from Buru and one from the Philippines, each geographical sample representing either new subspecies of *fulgens* or (more probably) new species of a *fulgens* superspecies. More material of both sexes is needed from Indonesia before the status of these undescribed taxa can be determined.

***Oreta fulgens* (Warren)**

Cobanilla fulgens Warren, 1899 : 1. Holotype ♂. Borneo, Mt. Dulit (*Hose*); Drepanidae genitalia slide No. 1362. In B.M. (N.H.).

Oreta fulgens (Warren) Warren, 1923 : 484. [Good fig.]

Oreta fulgens (Warren); Gaede, 1931 : 44.

Distribution. BORNEO (also possibly CELEBES, BURU and the PHILIPPINES—see above).

***Oreta rubromarginata* Swinhoe**

Oreta rubromarginata Swinhoe, 1902 : 592.

LECTOTYPE ♀, here designated, labelled: Borneo 92. 141; *Oreta rubromarginata* ♀ Swinhoe type; Drepanidae genitalia slide No. 1835. In B.M. (N.H.).

Oreta rubromarginata Swinhoe; Warren, 1923 : 484.

Oreta rubromarginata Swinhoe; Gaede, 1931 : 46.

Distribution. BORNEO.

***Oreta subrosea* (Warren)**

Gonoreta subrosea Warren, 1923 : 477. [Fig. 50*b* inaccurate but useful.] Holotype ♂. Borneo, Limbang, 7. iv. 1910; Drepanidae genitalia slide No. 1361. In B.M. (N.H.).

Oreta subrosea (Warren) Watson, 1965 : 71 [reference on line 19 should read (1923 : 477)].

Distribution. BORNEO.

***Oreta thaumalea* West**

Oreta thaumalea West, 1932 : 227. Holotype ♀. Philippines, Luzon, Manila, 7. v. 1911 (*Wileman*); Drepanidae genitalia slide No. 1834. In B.M. (N.H.).

Distribution. PHILIPPINES.

***Oreta triumbrata* (Warren)**

Cobanilla triumbrata Warren, 1899 : 2. Holotype ♀. Malaya, Penang, v. 1897 (*Curtis*); Drepanidae genitalia slide No. 1735. In B.M. (N.H.).

Oreta triumbrata (Warren) Warren, 1923 : 483. [Good fig.]

Oreta triumbrata (Warren); Gaede, 1931 : 47.

Distribution. MALAYA.

UROGONODES Warren

(Pl. 9, fig. 121 ; Text-figs. 80, 81)

Urogonodes Warren, 1903a : 347. Type-species, *Oreta scintillans* Warren, 1896 : 273, by original designation.

Urogonodes Warren; Warren, 1923 : 478; Gaede, 1931 : 41.

♂, ♀. Antenna closely lamellate. Proboscis vestigial. Outer margin of fore wing straight or evenly convex in *patiens*, angulate immediately posterior to Cu_{1a} in *scintillans* and *macrura*; areole absent; R_1 arises from near distal end of cell. Outer margin of hind wing evenly convex in *patiens*, angulate or with short process between M_3 and Cu_{1a} in *scintillans* and *macrura*. Ground-colour of wings highly variable.

Upper surface of fore wing usually with weakly marked antemedial fascia and postmedial fascia, absent in some specimens of each species except for dark costal markings, strongly marked in some females of *patiens*; postmedial fascia arises from near apex and meets anal margin at about three-fifths of its length measured from base of wing; antemedial fascia arises at about one-third of the distance along anal margin and diverges slightly from postmedial; dark subterminal marking almost invariably present between Cu_{1b} and $1A$, often extended anteriorly as far as Cu_{1a} . $Sc + R_1$ anastomoses for short distance with R_s distal to end of cell in hind wing. Upper surface of hind wing often without fasciae except for dark anal markings; with strongly marked antemedial fascia and postmedial fascia in some females of *patiens*. Upper surface of ♂ fore wing specked with lustrous white scales at distal margin of subterminal marking and between this marking and postmedial fascia.

Under surface of fore wing usually with dark postmedial fascia posterior to cell, and with whitish subterminal fascia most well-marked near apex. Under surface of hind wing usually without fasciae in *scintillans* and *macrura*, but with dark postmedial fascia in some specimens of these species and in most specimens of *patiens* examined.

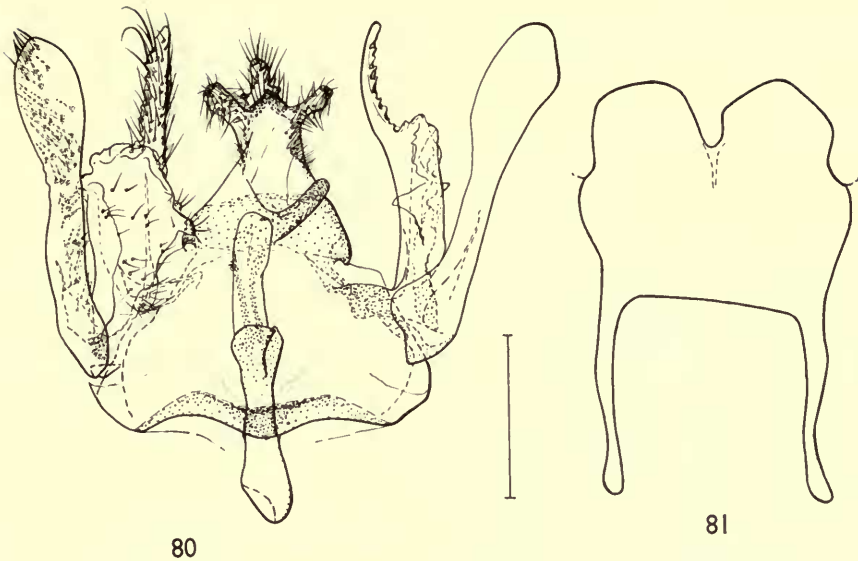
Mid and hind tibiae without glabrous longitudinal line.

♂ genitalia: saccus trilobate; valve bifid, well developed; uncus with two lateral processes and single posteriorly directed, medial process; gnathos with single posteriorly directed process; aedeagus fused to anterior margin of saccus; eighth abdominal sternite emarginate medially, with apodemes.

♀ genitalia: corpus bursae without signum; ostium with or without operculum; ninth segment well sclerotized; anterior and posterior apophyses short.

There is considerable individual variation in coloration and to some extent in the colour-pattern in the three species of *Urogonodes*. This has resulted in some synonymy, particularly in the species *scintillans*.

In colour-pattern and in overall pattern of the ♂ genitalia there is a reasonably close resemblance between *Urogonodes* and *Oreta* Walker. However, the absence of an areole in the fore wing, the origin of R_1 from the cell, the anastomosis of $Sc + R_1$ with R_s in the hind wing and the absence of a glabrous longitudinal line along the mid and hind tibiae indicate that the affinities between *Urogonodes* and *Oreta* are not particularly close. Affinities of a closer nature between *Urogonodes* and *Astatochroa*, another endemic Papuan genus, are suggested by the common venational characters of the origin of R_1 from the cell in the fore wing and the anastomosis of $Sc + R_1$ with R_s in the hind wing, and by the absence of a glabrous longitudinal line on the mid and hind tibiae. There are also broad similarities in the colour-pattern. In the ♂ genitalia there are general resemblances in the shape of the saccus, uncus and gnathos between *Urogonodes* and *Astatochroa*, though there is some discordance in the ♀



FIGS. 80-81. *Urogonodes scintillans* genitalia. 80, ♂, with aedeagus *in situ*;
81, ♂ eighth abdominal sternite.

genitalia in which there are differences in the shape of the ductus bursae and the ornamentation of the corpus bursae.

The closely related species *macrura* and *scintillans* form a group distinct from *patiens* which differs from them in wing-shape and in genitalic details. Only three species are known.

The genus is unknown outside New Guinea and the islands of the Louisiade Archipelago.

Urogonodes patiens (Warren) comb. n.

Oreta patiens Warren, 1906 : 62.

LECTOTYPE ♂, here designated, labelled: Angabunga R., affl. of St. Joseph R., Brit. N. Guinea, 6,000 ft. upwards, Nov. 04-Febr. 05 (*A. S. Meek*); *Oreta patiens* Type ♂ Warr.; *Psiloreta patiens* ♂ Warr.; Drepanidae genitalia slide No. 1276. In B.M. (N.H.).

Psiloreta patiens (Warren) Warren, 1923 : 487. [Fig.]

Psiloreta patiens (Warren); Gaede, 1931 : 48.

Distribution. PAPUA. Specimens in B.M. (N.H.) from other parts of New Guinea are externally identical with the lectotype but have not yet been dissected.

Urogonodes macrura Warren

Urogonodes macrura Warren, 1923 : 478. [Poor fig.]

LECTOTYPE ♂, here designated, labelled: Upper Setekwa R., Snow Mts., Dutch N.G., 2-3,000 ft., Sept. 1910 (*A. S. Meek*); *Urogonodes macrura* Type ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1853. In B.M. (N.H.).

Urogonodes macrura Warren; Gaede, 1931 : 42.

Urogonodes praecisa Warren, 1923 : 479. [Good fig.] **syn. n.** Holotype ♂. West Irian, Snow Mts., nr. Oetakwa R., up to 3,500 ft., x-xii. 1910 (*Meek*). In B.M. (N.H.).

Distribution. Parts of both eastern and western NEW GUINEA.

Urogonodes scintillans (Warren)

(Pl. 9, fig. 121 ; Text-figs. 80, 81)

Oreta scintillans Warren, 1896 : 273. Holotype ♀. Fergusson Is., xii. 1895 (*Meek*); Drepanidae genitalia slide No. 1878. In B.M. (N.H.).

Urogonodes scintillans (Warren) Warren, 1903a : 347.

Urogonodes scintillans (Warren); Warren, 1923 : 478. [In fig. 50a the outer margin of fore wing should be more angulate at middle.]

Urogonodes scintillans (Warren); Gaede, 1931 : 42.

Cyclura inconspicua Warren, 1899 : 3. Holotype ♀. St. Aignan, xi. 1897 (*Meek*). In the B.M. (N.H.). [Synonymized by Warren, 1903a : 347.]

Urogonodes colorata Warren, 1907 : 99. **syn. n.**

LECTOTYPE ♂, here designated, labelled: Biagi, Mambare R., 5,000 ft., B.N. G. Feb. '06 (*A. S. Meek*); *Urogonodes colorata* Type ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1881. In B.M. (N.H.).

Urogonodes colorata Warren; Warren, 1923 : 478. [Good fig.]

Urogonodes flavida Warren, 1907 : 100. **syn. n.** Holotype ♂ [not ♀ as stated by Warren]. Papua, Mambare R., Biagi, 5,000 ft., iii. 1906 (*Meek*). In B.M. (N.H.).

Urogonodes flavida Warren; Warren, 1923 : 478. [Good fig.]

Urogonodes flaviplaga Warren, 1923 : 478. [Fig.] **syn. n.**

LECTOTYPE ♂, here selected, labelled: Biagi, Mambare R., 5,000 ft., B.N. Guinea, ii. 1906 (*Meek*); *Urogonodes flaviplaga* Type ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1852. In B.M. (N.H.).

Urogonodes cervina Warren, 1923 : 478. [Poor fig.] **syn. n.**

LECTOTYPE ♂, here designated, labelled: Biagi, Mambare R., 5,000 ft. B.N. Guinea, Feb. '06 (*A. S. Meek*); *Urogonodes cervina* Type ♂ Warr.; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1851. In B.M. (N.H.).

Urogonodes fumosa Warren, 1923 : 479. [Fig.] **syn. n.** Holotype ♂. Papua, Angabunga R., affl. of St. Joseph R., 5,000 ft. upwards, xi. 1904-ii. 1905 (*Meek*); Drepanidae genitalia slide No. 1850. In B.M. (N.H.).

Distribution. PAPUA, the TERRITORY OF NEW GUINEA and the LOUISIADE ARCHIPELAGO.

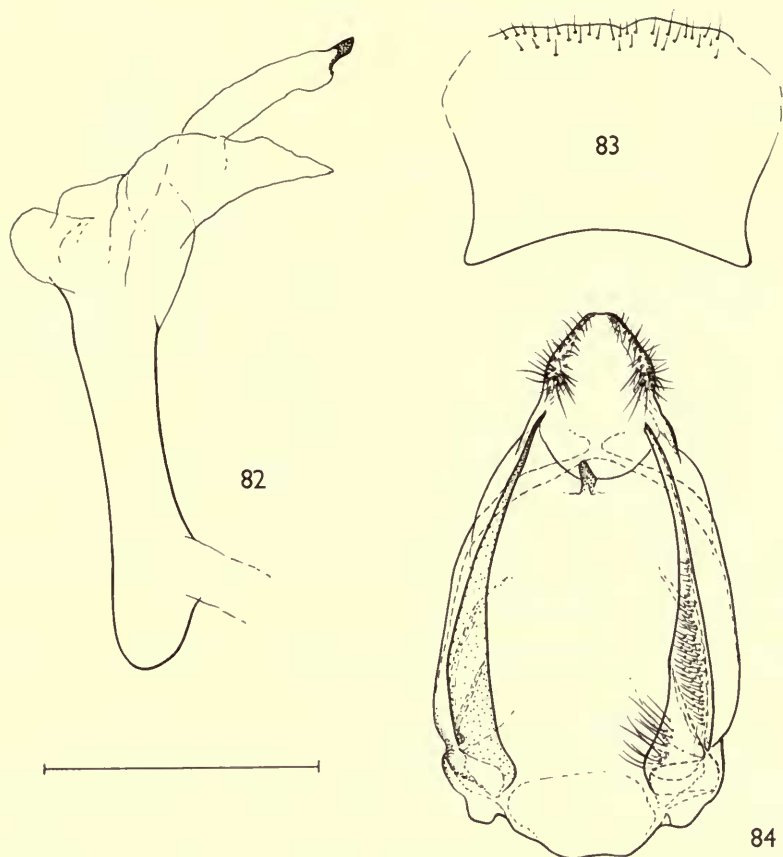
ASTATOCHROA Turner

(Pl. 9, fig. 122 ; Text-figs. 82-84)

Astatochroa Turner, 1926 : 415. Type-species, *Oreta fuscimargo* Warren, 1896a : 338, by monotypy.

♂, ♀. Antennae open-lamellate. Proboscis vestigial. Outer margin of fore wing evenly convex; areole present; R_1 arises from near distal end of cell. Outer margin of hind wing convex anteriorly, straight posteriorly; $Sc + R_1$ anastomosed with R_s for short distance distal to end of cell.

Ground-colour of upper surface of both wings subject to individual variation: pale yellow, buff or reddish buff. Fore wing with slightly arcuate antemedial fascia and oblique postmedial



FIGS. 82-84. *Astatochroa fuscimargo* genitalia. 82, aedeagus; 83, ♂ eighth abdominal sternite, 84, ♂.

fascia. Subterminal fascia most well marked as two dark spots, one on Cu_{1a} and the other on Cu_{1b} with a third less well marked spot present on $1A$ in some specimens. Hind wing with short, straight antemedial and postmedial fasciae and with darker area at margin of anterior angle of wing. Medial area on both wings either concolorous with rest of wing or darker.

Under surface of wing paler than upper surface. Pattern as for upper surface but reduced: without subterminal spots and without antemedial and postmedial fascia in some specimens.

Mid and hind tibiae without glabrous longitudinal line.

♂ genitalia: saccus trilobate; valves elongate, simple (asymmetric in *sulphurata*, not forming a pair); anterior margin of tegumen emarginate medially; gnathos with a single, medial, posteriorly directed process; vesica of aedeagus with or without cornutus; eighth abdominal tergum and sternum modified to some extent, each with pair of lateral apodemes.

♀ genitalia: ostial segment well sclerotized; corpus bursae with lateral accessory sac and two small invaginate, acuminate signa.

The combination of two venational characters together with a negative character in the legs and general similarities in the colour-pattern and the ♂ genitalia suggest

that quite close affinities exist between *Astatochroa* and *Urogonodes* Warren (see page 206).

Astatochroa is known only from Northern Queensland (Australia) and from Papua (New Guinea).

***Astatochroa fuscimargo* (Warren) comb. rev.**

(Pl. 9, fig. 122 ; Text-figs. 82-84)

- Oreta fuscimargo* Warren, 1896a : 338. Holotype ♀. [N. Queensland] Coomooboolaroo Duaringa (Meek); Drepanidae genitalia slide No. 1896. In B.M. (N.H.).
Psiloreta fuscimargo (Warren) Warren, 1923 : 488. [Fig.]
Astatochroa fuscimargo (Warren) Turner, 1926 : 415.
Psiloreta fuscimargo (Warren); Gaede, 1931 : 48.
Oreta pusilla Warren, 1900 : 99. [Synonymized by Gaede, 1931 : 48.] Holotype ♂. [N. Queensland] Yeppoon Q.L., ix. 1890 (Barnard). In B.M. (N.H.).
Psiloreta pusilla (Warren) Warren, 1923 : 487. [Fig.]
Oreta roseola Warren, 1900 : 99. [Synonymized by Gaede, 1931 : 48.] Holotype ♀. [N. Queensland] Dawson Dist. (Barnard); Drepanidae genitalia slide No. 1897. In B.M. (N.H.).
Psiloreta roseola (Warren) Warren, 1923 : 488. [Fig.]
Artaxa usta Lucas, 1901 : 76. [Synonymized by Gaede, 1931 : 48.] Holotype ♂. Queensland (Lucas-Rye Bellenden Ker Expedition). In the South Australian Museum, Adelaide, according to Turner, 1926 : 415. [Type not seen.]

Distribution. AUSTRALIA, Northern Queensland.

***Astatochroa sulphurata* Warren comb. n.**

- Oreta sulphurata* Warren, 1907 : 98.
LECTOTYPE ♂, here designated, labelled: Biagi, Mambare R., 5,000 ft., B. N. G. [New Guinea, Papua], Feb. '06., (A. S. Meek); *Oreta sulphurata* Type ♂ Warr.; *Psiloreta sulphurata* Warr. ♂; Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1728. In B.M. (N.H.).
Psiloreta sulphurata (Warren) Warren, 1923 : 487. [Good fig., probably of the lectotype.]
Psiloreta sulphurata (Warren); Gaede, 1931 : 49.

Distribution. NEW GUINEA, Papua.

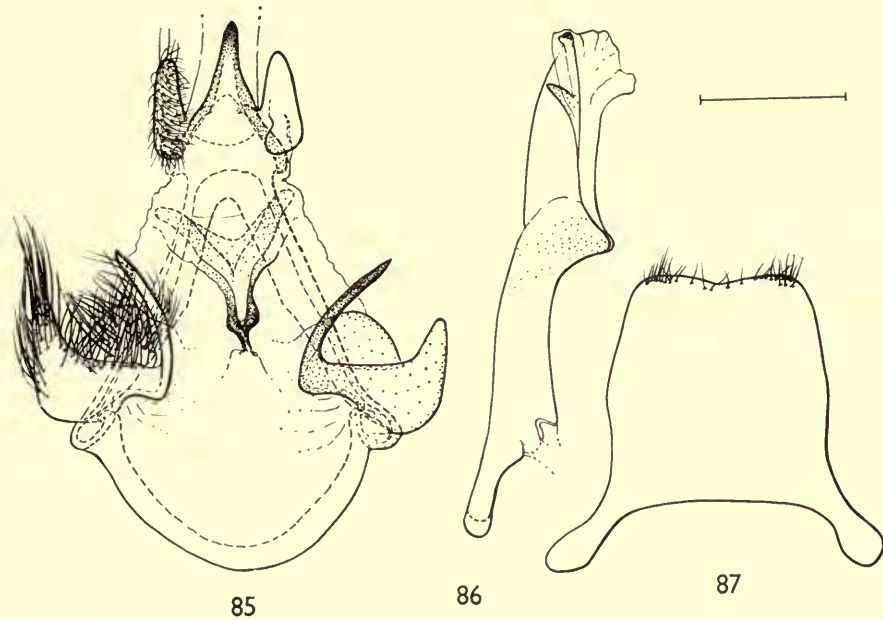
***SPECTRORETA* Warren**

(Pl. 9, fig. 123 ; Text-figs. 85-87)

- Spectroreta* Warren, 1903 : 255. Type-species, *Oreta hyalodisca* Hampson, 1896 : 479, by original designation.
Spectroreta Warren; Warren, 1923 : 476; Gaede, 1931 : 40.

♂, ♀. Antennae bipectinate. Proboscis absent.

Outer margin of fore wing and hind wing with short process between M_3 and Cu_{1a} . Antemedial fascia of upper surface of fore wing dark, weakly marked, irregularly shaped; postmedial fascia slightly oblique, dark, edged distally with lustrous scales; large irregular hyaline patch present between medial fascia; subterminal markings dark between Cu_{1a} and Cu_{1b} , mainly pale yellow anterior to Cu_{1a} . Antemedial fascia of upper surface of hind wing very weakly marked; postmedial fascia straight, dark, often edged distally with lustrous scales; dark spot present at



Figs. 85-87. *Spectroreta hyalodisca* genitalia. 85, ♂; 86, aedeagus; 87, ♂ eighth abdominal sternite.

posterodistal end of cell, with adjacent small hyaline patches between M_2 and Cu_{1b} ; subterminal fascia best marked between Cu_{1a} and Cu_{1b} as a dark patch. Under surface of both wings with sinuous postmedial fascia (not corresponding in position with postmedial fascia of upper surface), otherwise without fasciae.

Areole usually absent in fore wing, very short if present; R_1 arising from near distal end of cell. $Sc + R_1$ anastomoses for short distance distal to end of cell in hind wing.

Mid and hind tibiae without longitudinal glabrous line.

♂ genitalia: saccus evenly convex; valve short, with single, proximal, curved spine; uncus with single, medial, ventrally directed, arcuate process, and pair of lateral, weakly sclerotized, setose lobes; gnathos with single, medial ventrally directed, arcuate process, its apex concave posteriorly; eighth abdominal sternite modified, with moderately short apodemes; eighth tergite little modified.

♀ genitalia: corpus bursae with two medially invaginate signa; ostial and postostial segments well sclerotized.

As in many other genera of Oretinae there is a considerable degree of variation in coloration between individuals of its species.

Certain common features suggest that the nearest relative of *Spectroreta* is the Madagascan *Archidrepana* Warren (1902a: 487) (see also Watson, 1965: 142). Unlike all other Oretinae both genera have completely lost the proboscis, while in the ♂ genitalia the shape of the gnathos and medial process of the uncus are similar in both genera. In colour-pattern and wing-shape very close similarities exist. In other characters there is some concordance between the two genera, but sufficient dissimilarity to warrant the continued recognition of two separate genera.

Spectroreta occurs in the Indian, Indo-Chinese and Malayan Subregions and is also known from one specimen taken in Key Island. Only one species is known.

***Spectroreta hyalodisca* (Hampson)**

(Pl. 9, fig. 123; Text-figs. 85-87)

Oreta hyalodisca Hampson, 1896 : 479.

Spectroreta hyalodisca (Hampson) Warren, 1903 : 255.

Spectroreta hyalodisca (Hampson); Warren, 1923 : 476. [Good figs.]

Spectroreta hyalodisca (Hampson); Gaede, 1931 : 40.

In wing-shape, colour-pattern and ♂ genitalia, *Spectroreta* most closely resembles *Archidrepana* Warren (1902a : 487) (see figs. in Watson, 1965). The ♂ genitalia (Text-figs. 85-87) have some features in common with those of *Oretopsis* Watson (1965 : 145), also a Madagascan genus.

There is much individual variation in coloration of the upper surface of the wings and some variation in the shape and size of the hyaline patches. Three infra-specific names have been applied to differently marked specimens by Warren (see Gaede, 1931 : 41).

Wing : ♂ 15.0-19.0 mm. (30) ; ♀ 19.5-20.0 mm. (6).

Ceylon, N.E. India, Burma, southern China, Sumatra, Malaya and Key Island are included in the range of this species. A comparison of the ♂ genitalia has shown that the nominate subspecies occurs in N.E. India, Burma and China (see list below), that the Ceylon material probably represents a new subspecies, and that two new subspecies await description from Malaya and Key Island respectively. Two males from Sumatra probably represent the same subspecies as the single ♂ from Malaya. *Oreta hyalodisca* is one of the few species of Oretinae having continental Asian affinities which is shared by the Malayan Subregion and the Papuan Subregion.

Type material.

LECTOTYPE ♂, here designated, labelled : Khasis, Nat. Coll ; *Oreta hyalodisca* type ♂ Hmpsn. ; Collectio H. J. Elwes ; Rothschild Bequest B.M. 1939-1 ; Drepanidae genitalia slide No. 131. In B.M. (N.H.).

Other material (nominate subspecies). B.M. (N.H.). N.E. INDIA : 11 ♂, 6 ♀, Khasis, ix, x. 1894, iv-x. 1895. BURMA : 1 ♂, Chin Hills, Pakokku, Mt. Victoria, 2,200 m., 15-30. vi. 1938 (*Heinrich*). CHINA : 1 ♂, Chekiang, Wenchow, vii. 1939 (*Höne*) ; 1 ♂ [Kwangsi], Lingping, 9. v. 1922 (*Höne*). *Museum Koenig*. CHINA : 13 ♂, Chekiang, Wenchow, vi, vii. 1939 (*Höne*) ; 1 ♂ [Kwangsi], Lingping, 11. v. 1922 (*Höne*).

CYCLURA Warren

(Pl. 9, fig. 124 ; Text-figs. 88-90)

Cyclura Warren, 1897 : 14. Type-species, *Cyclura excisa* Warren, 1897 : 14, by monotypy.

Cyclura Warren ; Gaede, 1931 : 41.

Tomocerota Matsumura, 1921 : 946. Type-species, *Tomocerota formosana* Matsumura, 1921 : 946, by monotypy. **syn. n.**

Neoveta Warren, 1923 : 476. Type-species, *Oreta olga* Swinhoe, 1894 : 434, by original designation. **syn. n.**

Neoveta Warren; Gaede, 1931 : 41.

Procampsis Warren, 1923 : 488. Type-species, *Procampsis trogoptera* Warren, 1923 : 488, by monotypy. **syn. n.**

"*Procampsis*" Warren; Gaede, 1931 : 49. An incorrect subsequent spelling of *Procampsis* Warren, 1923.

Amphitorna Turner, 1911 : 95. Type-species, *Amphitorna lechriodes* Turner, 1926 : 414, by monotypy [originally cited as *Oreta fuscimargo* Warren, 1896 : 338, a misidentification corrected by Turner, 1926 : 414, who identified and described the type-species as *Amphitorna lechriodes* Turner]. **syn. n.**

Amphitorna Turner; Gaede, 1931 : 49.

♂, ♀. Antennae bipectinate in *olga*, *purpureofascia* and *perexcisa*; closely lamellate in remaining species. Proboscis vestigial.

Outer margin of fore wing straight, convex, or with short process between M_3 and Cu_{1a} ; R_1 arises from near end of cell, or from areole. Outer margin of hind wing nearly evenly convex; or with a single, short, posteriorly directed process between M_3 and Cu_{1a} ; Sc and R_1 anatomosed with, or approximated to R_s distal to end of cell.

Upper surface of fore wing one of various shades of yellowish or reddish brown; antemedial fascia dark, irregularly shaped; postmedial fascia dark, well-marked, straight or weakly arcuate, usually with one or two conspicuous dark brown markings immediately anterior to point near costa where fascia is bent inwards towards thorax (without dark postmedial markings in females of *albipuncta* and *castanea*); medial area darker than rest of wing in some specimens of each species, except for *trogoptera* in which a pale medial patch is present in those specimens having a general dark brown coloration; pale discocellular spot present in most specimens of each species. Ground-colour of upper surface of hind wing as for fore wing; antemedial fascia usually absent, but weakly marked in a few specimens; postmedial fascia well marked, straight or slightly arcuate; medial area as for fore wing but without pale patch in *trogoptera*.

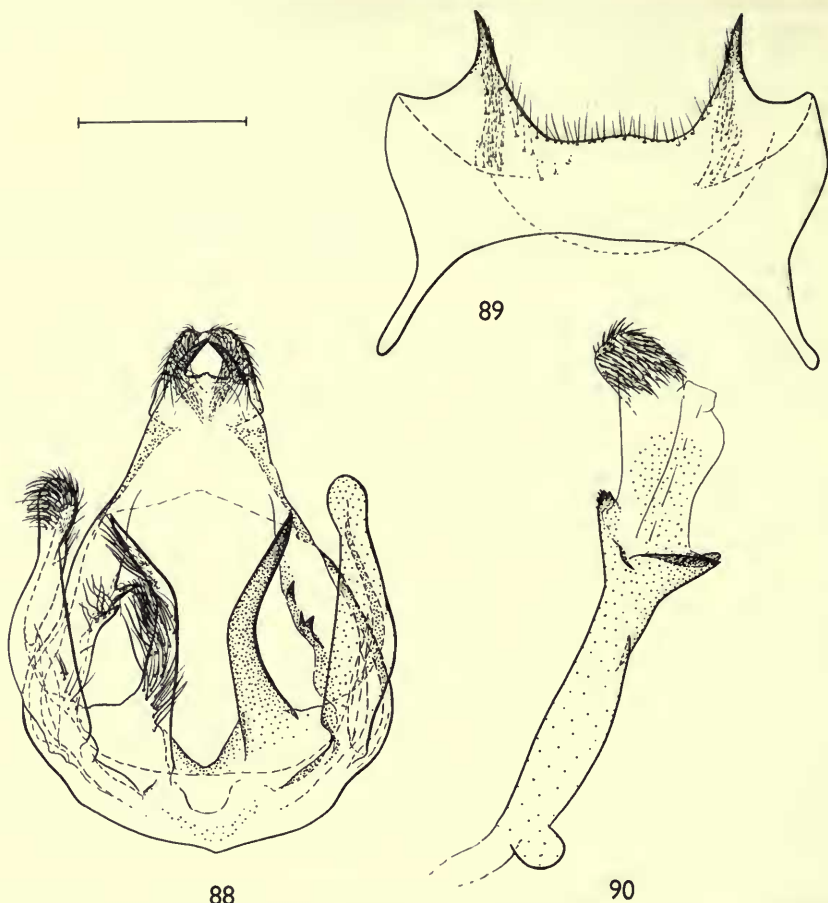
Under surface of both wings pale pinkish buff, speckled with dark brown. Weakly marked postmedial fascia present on both wings in some specimens of each species, not corresponding exactly with position of this fascia on upper surface of wing; fascia absent in most specimens. Antemedial fascia absent on both wings.

Mid and hind tibiae without glabrous longitudinal line.

♂ genitalia: anterior margin of saccus concave medially in *olga*, *perexcisa* and *purpureofascia*, convex in remaining species; valve with or without costal spine; gnathos a pair of posteriorly directed, forcipulate processes; anellus represented by two acuminate, posteriorly directed processes, the latter equal in shape or unequal; vesica of aedeagus without ornamentation or, usually, with spines or scobinations; eighth abdominal tergite not strongly modified, but with short, stout, medial spine at posterior margin in a specimen of an undescribed species in the B.M. (N.H.) collection; eighth sternite with pair of posterior processes.

♀ genitalia (*olga* and *castanea*): eighth segment well developed; single bilobed spinose signum present. (Remaining species are either unknown from the female or have yet to be examined.)

Except for the absence of dark postmedial markings on both wings and the presence of the characteristic dark postmedial markings on the fore wing of *Cyclura*, there are close similarities in the colour-pattern and coloration between this genus and the Ethiopian *Epicamptoptera* Bryk (1913 : 7) (see Watson, 1965 : 9). The ♂ genitalia of *Cyclura* differ from those of *Epicamptoptera* particularly in the presence of a gnathos and anellar processes, although in *Epicamptoptera lumaria* Watson (1965 : 45) two short lobes lateral to the aedeagus are possibly homologous with these anellar processes.



FIGS. 88-90. *Cyclura excisa* genitalia. 88, ♂; 89, ♂ eighth abdominal sternite; 90, aedeagus.

It seems probable that further study will reveal the presence of at least two reasonably well-defined species-groups in *Cyclura*: the first comprising *albipuncta* and its close ally *castanea*, together with *lechriodes* and its close ally *trogoptera*; the second comprising *olga*, *perexcisa* and *purpureofascia*. The species *excisa*, and *confusata*, which is known only from the ♀, may prove to represent a third group.

Nine named species are recognised in this paper, all are Oriental: *albipuncta* and *castanea* which are confined to the Indian subregion; *purpureofascia* which is known only from Formosa; *olga* which extends eastwards from N.E. India across the Indo-Chinese subregion as far as Formosa but has not yet been recorded from the mainland of China; *excisa* and *perexcisa* which are endemic to the Malayan subregion; *confusata*, known only from the Obi Islands, south of Halmahera, in the Papuan Subregion; and finally *lechriodes* and *trogoptera* which are also Papuan endemics, the former species occurring in Cape York Peninsula, Australia, and the

latter in New Guinea. Two undescribed species are represented by material in B.M. (N.H.): one of these is known only from the Philippines, the other from Celebes, Buru and Halmahera.

***Cyclura albipuncta* (Hampson) comb. n.**

Oreta albipuncta Hampson, [1893] : 69. [Coloured fig. Fore wing pattern inaccurate.]

LECTOTYPE ♂ [single known syntype is ♂] here designated, labelled: Trincomali, Ceylon, 23.9.90; *Oreta albipuncta* Hampson; Ceylon, Yerbury Coll. 92-192; Drepanidae genitalia slide No. 1830. In B.M. (N.H.).

Psiloreta albipuncta (Hampson) Warren, 1923 : 486. [Poor fig.]

Psiloreta albipuncta (Hampson); Gaede, 1931 : 47.

Distribution. CEYLON.

***Cyclura castanea* (Hampson) comb. n.**

Oreta castanea Hampson, 1891 : 9. [Fig.]

LECTOTYPE ♂ [single known syntype is ♂], here designated, labelled: Nilgiris, Hampson Coll. 89-129; *Oreta castanea* Hampson, type ♀; Drepanidae genitalia slide No. 1725. In B.M. (N.H.).

Psiloreta castanea (Hampson) Warren, 1923 : 487. [Poor fig.]

Psiloreta castanea (Hampson); Gaede, 1931 : 48.

Oreta rotundipex Hampson, 1891 : 9. [Poor fig.] **syn. n.**

LECTOTYPE ♀, here designated, labelled: Nilgiris, Hampson Coll. 89-129; *Oreta rotundipex* Hampson type ♀; Drepanidae genitalia slide No. 1724. In B.M. (N.H.).

Psiloreta "rotundapex" (Hampson) Warren, 1923 : 486. An incorrect subsequent spelling of *rotundipex*. [Poor fig.]

Psiloreta "rotundapex" (Hampson); Gaede, 1931 : 49. An incorrect subsequent spelling of *rotundipex*.

Distribution. SOUTH INDIA, Nilgiris.

***Cyclura lechriodes* (Turner) comb. n.**

Amphitorna lechriodes Turner, 1926 : 414.

LECTOTYPE ♂, here designated, labelled: Kuranda Qld., Apl., (*F. P. Dodd*); B.M. negative Nos. 39503 and 1763 (genitalia). In the C.S.I.R.O. Collection, Canberra.

Amphitorna lechriodes Turner; Gaede, 1931 : 49.

Distribution. AUSTRALIA, northern Queensland.

***Cyclura trogoptera* (Rothschild) comb. n.**

Oreta trogoptera Rothschild, 1915 : 109. Holotype ♂ [not ♀ as stated by Rothschild]. Dutch New Guinea [West Irian], Utakwa R., sea level, Base Camp, i.1913 (*Wollaston*); Drepanidae genitalia slide No. 1720. In B.M. (N.H.).

Oreta trogoptera Rothschild; Gaede, 1931 : 47.

Procampsis trogoptera Warren, 1923 : 488 [Poor fig.] **syn. n.** [*trogoptera* Warren was independently described as a new species and is a junior secondary homonym of *trogoptera* Rothschild.]

LECTOTYPE ♂, here designated, labelled: Mt. Goliath, 500 ft.; Centr. Dutch New Guinea, about 139° long., February 1911 (*A. S. Meek*); *Procampsis trogoptera* Warr. Type ♂, Rothschild Bequest B.M. 1939-1; Drepanidae genitalia slide No. 1721. In B.M. (N.H.).

Procampsis trogoptera Warren; Gaede, 1931 : 49.

Distribution. NEW GUINEA, West Irian,

***Cyclura excisa* Warren**

(Pl. 9, fig. 124 ; Text-figs. 88-90)

Cyclura excisa Warren, 1897 : 14. Holotype ♂. N.E. Borneo, Penungah, 27.xii.1893. Drepanidae genitalia slide No. 1849. In B.M. (N.H.).*Cyclura excisa* Warren; Gaede, 1931 : 41.

Distribution. N.E. BORNEO, and probably SUMATRA and MALAYA (material not yet fully examined).

Cyclura confusata* WarrenCyclura confusata* Warren, 1899 : 3. Holotype ♀. Obi, Laiwui, ix.1897 (*Doherty*). In B.M. (N.H.).*Cyclura confusata* Warren; Warren, 1923 : 477. [Poor fig.]*Cyclura confusata* Warren; Gaede, 1931 : 41.

Distribution. OBI ISLANDS.

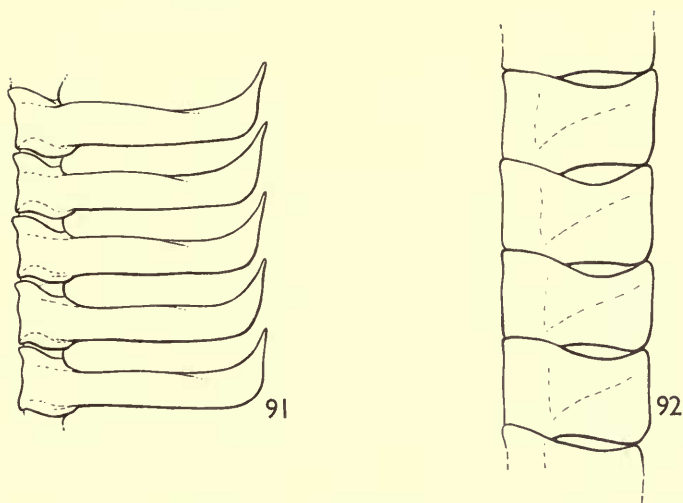
Cyclura olga* (Swinhoe) comb. n.Oreta olga* Swinhoe, 1894 : 434.LECTOTYPE ♂, here designated, labelled: Shillong, Khasi Hills, 95-224; *Oreta olga* Swinhoe ♂ type; Drepanidae genitalia slide No. 133. In B.M. (N.H.).*Neoreta olga* (Swinhoe) Warren, 1923 : 477. [Poor fig.]*Neoreta olga* (Swinhoe); Gaede, 1931 : 41.*Oreta "loga"* Swinhoe; Gaede, 1931 : 45. [An incorrect subsequent spelling of *olga* Swinhoe.]

Distribution. N.E. INDIA.

Cyclura purpureofascia* (Wileman)Oreta purpureofascia* Wileman, 1911 : 149. Poor fig.LECTOTYPE ♂, here designated, labelled: ♂ Kanshirei, Formosa, 1,000 ft., 2.v.1907, A. E. Wileman; Wileman Coll., B.M. 1929-261; *Oreta purpureofascia* Type ♂, sp.n.; Drepanidae genitalia slide No. 135. In B.M. (N.H.).*Neoreta olga* ab. *purpureofascia* (Wileman) Warren, 1923 : 477.*Neoreta olga* ab. *purpureofasciata* (Wileman); Gaede 1931 : 41. [Incorrect subsequent spelling of *purpureofascia*.]*Tomocerota purpureofasciata* (Wileman) Matsumura, 1931 : 747. [Incorrect subsequent spelling of *purpureofascia*.]*Tomocerota formosana* Matsumura, 1921 : 946. Holotype ♂. Formosa, iv.1916 (Matsumura) [not seen]. [Synonymized with *purpureofascia* by Matsumura, 1931 : 747.]

Distribution. FORMOSA.

The type of *Oreta purpureofascia* ab. *unicolor* Wileman, 1911 : 149 is conspecific with the type of *purpureofascia* Wileman.***Cyclura perexcisa* (Warren) comb. n.***Neoreta perexcisa* Warren, 1923 : 477. [Fair fig.] Holotype ♂. Gunong Ijau; Drepanidae genitalia slide No. 1848. In B.M. (N.H.).*Neoreta perexcisa* Warren; Gaede, 1931 : 41.



FIGS. 91-92. *Oreta* antennae. 91, *roepkei*, section of ♂ antenna. 92, *insignis*, section of ♂ antenna.

Distribution. MALAYA, S.E. BORNEO, and probably BALI, JAVA and SUMATRA (material in B.M. (N.H.)).

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INDEX

Index to nominal genera, species and subspecies
(synonyms and homonyms in *italics*)

- acutior Watson, 203
 acutula ssp.n., 191
 albipuncta Hampson, 215
 amblyptila Warren, 198
 americana Herrich-Schäffer, 162
Amphitorna Turner, 213
 angularis sp. n., 187
 Astatochroa Turner, 208
 aurata Warren, 198
 auripes Butler, 164
- berenica* Swinhoe, 202
 bicolor Warren, 197
 brunnea Wileman, 194
- calceolaria* Butler, 164
 calida Butler, 169
 cardinalis Warren, 202
 carnea Butler, 202
 castanea Hampson, 215
 castaneata Warren, 199
 cervina Warren, *Oreta*, 199
 cervina, Warren *Urogonodes*, 208
 chosenoreta Bryk, 164
 colorata Warren, 208
 confusata Warren, 216
 continua Warren, 198
 Cyclura Warren, 212
- dejeani ssp. n., 194
 dissimilis Warren, 198
Dryopteris Grote, 153
- eminens Bryk, 184
 erminea Warren, 203
 excisa Warren, 216
 extensa Walker, 200
- figlina* Swinhoe, 200
 flavida Warren, 208
 flaviplaga Warren, 208
 flavobrunnea sp. n., 186
- formosana* Matsumura, 216
formosana Strand, 196
formosicola Matsumura, 168
 formula Grote, 162
 fulgens Warren, 205
 fulvata Warren, 203
 fumosa Warren, 208
 fuscimargo Warren, 210
 fuscipurpurea Inoue, 201
- griseotincta Hampson, 202
- hepatica* Warren, 203
hepaticata Warren, 202
 hoenei sp. n., 172
Holoreta Warren, 154
 horishana Matsumura, 203
 hyalodisca Hampson, 212
 hypocalla Lower, 203
Hypsomadius Butler, 153
- inangulata ssp. n., 173
 inconspicua Warren, 208
 indentata Watson, 203
 insignis Butler, 196
 irrorata Packard, 162
- jaspidea Warren, 203
- kalisi Watson, 198
- lechriodes Turner, 215
 leucospila Joicey & Talbot, 198
 liensis sp. n., 179
 loga, 216
 loochooana Swinhoe, 166
 luculenta ssp. n., 189
- macrura Warren, 207
 marginata Walker, 162
Mimoreta Matsumura, 154
 mollita Warren, 199

Neoreta Warren, 213
nucicolor Warren, 203

obtusa Walker, 191
olga Swinhoe, 216
olivacea Dudgeon, 203
olivacea Warren, 182
Oreta Walker, 153
Oretella Strand, 154

paki sp.n., 170
patiens Warren, 207
pavaca Moore, 181
perexcisa Warren, 216
perfida Warren, 197
perobliquilinea Warren, 197
praecisa Warren, 208
Procampis, 213
Procampsis Warren, 213
Psiloreta Warren, 154
pulchripes Butler, 164
purpurea Inoue, 201
purpurea Warren, 182
purpureofascia Wileman, 216
purpureofasciata, 216
pusilla Warren, 210

Rhamphoreta Bryk, 154
roepkei Watson, 200
rosea Walker, 162
roseola Warren, 210
rotundapex, 215
rotundipex Hampson, 215
rubicunda Warren, 204
rubrifumata Warren, 204

rubromarginata Swinhoe, 205

sanguinea Moore, 181
scintillans Warren, 208
shania sp. n., 175
sinensis ssp. n., 184
singapura Swinhoe, 197
speciosa Bryk, 192
Spectroreta Warren, 210
squamulata Strand, 168
sublustris Warren, 198
subrosea Warren, 205
subvinosa Warren, 198
suffusa Walker, 200
sulphurata Warren, 210

thaumalea West, 205
thermidora Hampson, 164
tienia ssp. n., 175
timutia ssp. n., 168
Tomocerota Matsumura, 212
trispina sp. n., 177
triumbrata Warren, 205
trogoptera Rothschild, 215
trogoptera Warren, 215
tsina ssp. n., 191
turpis Butler, 169

unilinea Warren, 199
Urogonodes, 206
usta Lucas, 210
ustimacula Warren, 198

vatama Moore, 187
violacea Hampson, 200